NEW HORIZONS: PAST AND FUTURE FLYBYS. C. B. Olkin[1], J. C. Cook[1], J. Lovering[1], A. Lunsford[2], and the New Horizons Science Team, [1]Department of Space Studies, Southwest Research Institute, 1050 Walnut Street, Boulder, CO 80302 colkin@boulders.swri.edu, jccook@boulder.swri.edu, and lovering@boulder.swri.edu [2]NASA Goddard Space Flight Center, Code 693, Greenbelt, MD 20771 allen.lunsford@gsfc.nasa.gov

New Horizons will be the first mission to explore ice dwarf worlds. We will provide the first detailed look at Pluto and its moons and then continue on to examine one or more Kuiper Belt objects.

New Horizons had a successful launch on January 19, 2006. With a launch early in our window of opportunity, such as this, the trajectory to Pluto allowed for a flyby of Jupiter. The flyby of Jupiter was beneficial in a few ways: (i) it reduced our travel time to Pluto to 9.5 years, (ii) it allowed us to exercise our instruments during an actual planetary encounter, and (iii) it provided the opportunity to do unique science in the jovian system.

Our flight path to Pluto also allowed for a seredipitious distant flyby of a small asteroid. Less than 5 months after launch, we flew within approximately 102,000 km of the small asteroid 2002 JF56, now named APL. At closest approach asteroid APL was not well resolved, but it did show a distinct asymetry attributable either to an elongated shape or a satellite.

The New Horizons payload consists of 7 instruments. Alice [1] is an ultraviolet imaging spectrograph that will be used to learn about the composition of Pluto's atmosphere as a function of altitude through a solar occultation. Ralph [2] is a visible and near-IR imager and an IR hyperspectral imager that will provide color maps of Pluto and its moons, as well as, infrared spectral (1.25 μm to 2.5 μm) maps which are diagnostic of surface composition and temperature. LORRI [3], LOng Range Reconnaissance Imager, is a high resolution visible imager that will provide our most detailed views of the surfaces of Pluto and its moons. SWAP [4], Solar Wind Around Pluto, is a solar wind and plasma spectrometer designed to observe Pluto's interaction with the solar wind and measure the escape rate of Pluto's atmosphere. PEPSSI [5], Pluto Energetic Particle Spectrometer Science Investigation, is an energetic particle spectrometer that will measure the mass, energy spectra and directional distribution of energetic particles near Pluto. SDC [6], the Venetia Burney Student Dust Counter, was designed and built by students at the University of Colorado and will measure the dust distribution in our solar system. The REX [7] instrument, Radioscience Experiment, will measure the delay of radio signals uplinked from the DSN to determine the atmospheric pressure and temperature in Pluto's lower atmosphere as well as probe the electron density in Pluto's ionosphere.

Results of New Horizon's previous flybys (asteroid APL and Jupiter) will be presented. We will also highlight some of the science we plan to do during our encounter with the Pluto system.

References:

[1] Stern A. S. et al. (2005) *SPIE, vol. 5906*. [2] Reuter D. et al. (2005) *SPIE, vol. 5906*. [3] Cheng A. F. *Space Sci. Rev. in press (http://arxiv.org/abs/0709.4278)*. [4] McComas D. *Space Sci. Rev. in press (http://arxiv.org/abs/0709.4505)*. [5] McNutt R. L. *Space Sci. Rev. in press (http://arxiv.org/abs/0709.4428)*. [6] Horanyi M. *Space Sci. Rev. in press*. [7] Tyler G. L. *Space Sci. Rev. in press*.

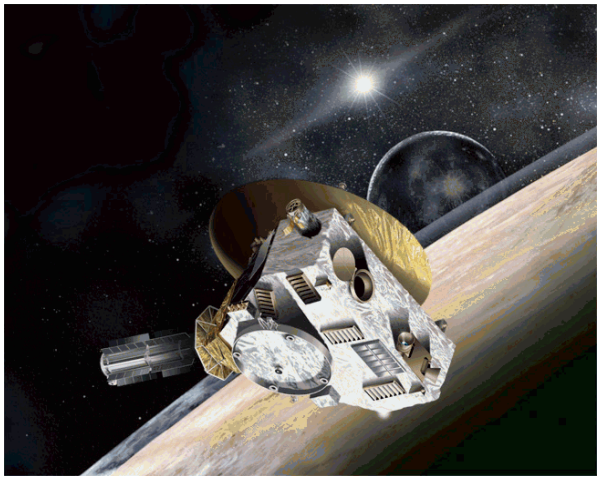

Figure 1. An artist rendition of New Horizons at Pluto, courtesy of NASA.