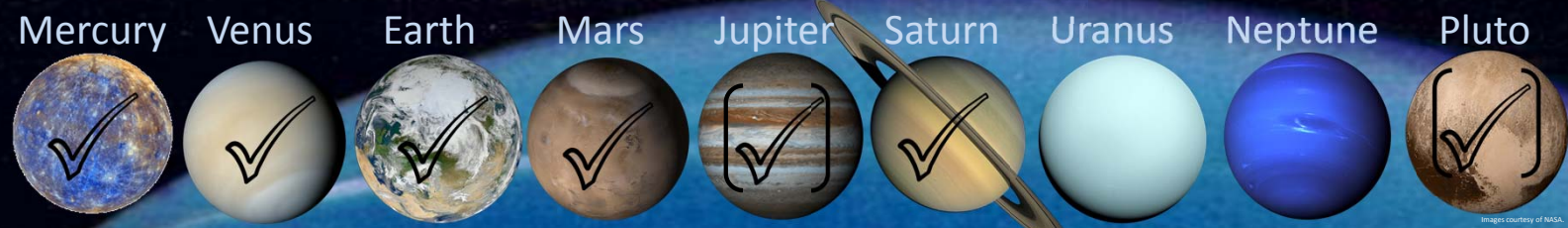


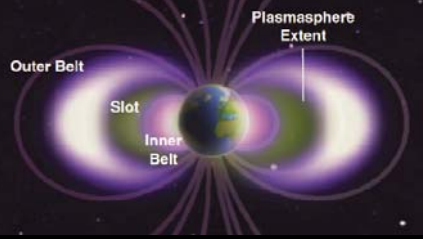
'It Takes a Village.' The Case For Collaborative (Outer Planet) Missions.

Abigail Rymer, with thanks to Elizabeth (Zibi) Turtle, Mark Hofstadter, Amy Simon, and George Hospodarsky



Motivated to encourage more planned cross disciplinary science discovery and exploration we first introduce a few serendipitous events.

Explorer 1 discovers the Van Allen belts at Earth....

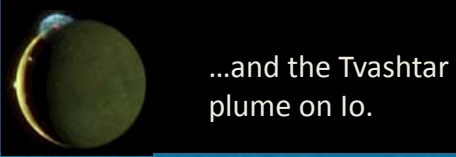
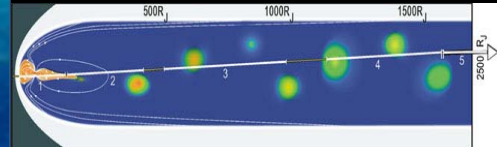


...and not at Mars (Mariner 4, July 1965)

New Horizons Captures Pluto's and the Nations' Heart...



...and peculiar plasma physics of Jupiter's deep tail...



We can't predict where the surprises will arise, but we can admit margin onto our payloads that better allow for discovery. This could be facilitated by directed efforts to: 1) Canvas other disciplines and agencies at the early stages of missions; 2) Consult on the instrumentation, orbit, and launch timing and 3) Directly solicit input on what might be achieved in addition to the main mission.

Additionally, 4) Enable planning of multiple missions in harmony for example a combined Ice Giants/ Interstellar Probe/ Heliospheric Observer/ Exoplanet Telescope. Such an approach continues the example of collaboration begun by the NASA Apollo program.

Plan to be Lucky



(FU, the Chinese symbol means good fortune)

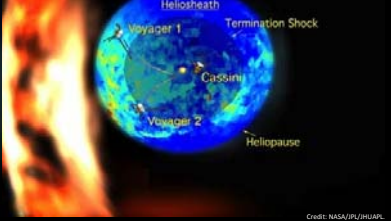
Ice Giants mission to Uranus, Neptune and ...

The only class of planet in our solar system to have not had a dedicated orbiting mission; the Ice Giants are fundamentally different from Gas Giants (Jupiter and Saturn) being mostly composed of 'ices' compared to the gas giants which are 90% Hydrogen and Helium. Apparently serene, Uranus has a peculiar obliquity, puzzling interior structure, among the most energetic radiation belts ever observed but weak evanescent aurora. Despite its location at the edge of the Solar System, Neptune is home to fastest winds ever recorded.

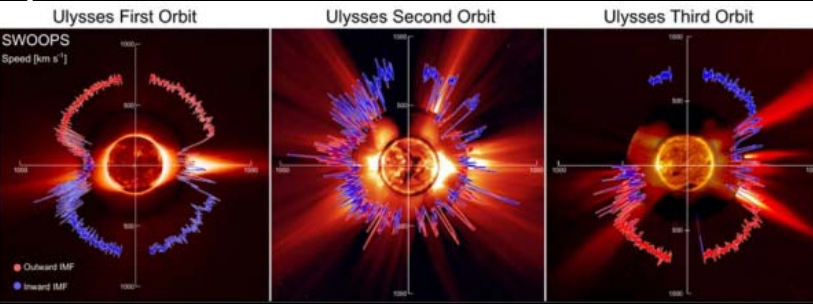
Cassini Images Saturn...



...and the Heliosphere.

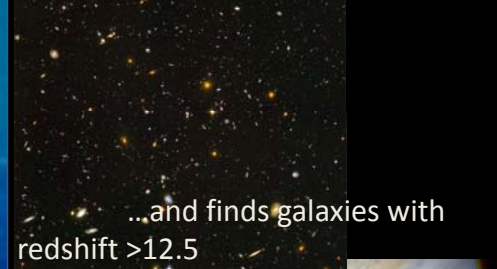


Ulysses Orbits the Sun's Poles...



...and Crosses Comet tail
...and detects TWO Gamma Ray Bursters.

HST looks for dark skies...



High-altitude clouds at 29N observed by Voyager