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IWU Astronomer Eager for Probe's Flyby of Pluto

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Linda French

BLOOMINGTON, Ill.— Illinois Wesleyan University Chair and Professor of Physics Linda French had July 14, 2015, circled on her calendar for nearly a decade.

That's the date NASA space probe New Horizons passed by dwarf planet Pluto in the first flyby of a spacecraft. New Horizons was launched in January 2006.

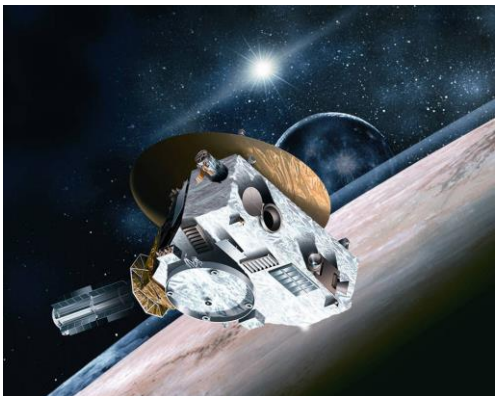
A professional astronomer for more than 30 years, French's research involves the study of the shapes and surfaces of asteroids and comets, and she's currently involved in a National Science Foundation-funded study of Trojan asteroids, a large group of more than 5,000 objects sharing Jupiter's orbit around the sun.

Her research, along with the New Horizons mission, investigates some of the same questions: how did the solar system form and what can we learn about it by studying smaller bodies such as moons, asteroids and comets? She provided these insights on the New Horizons flyby:

What is your professional association with Pluto?

My first observations from Cerro Tololo Inter-American Observatory in Chile were of Pluto. My postdoctoral advisor, Jim Elliot, and I tried to observe Pluto occulting, which is basically eclipsing, a star. We didn't see it, but Jim and his team did observe a Pluto occultation several years later. Jim's observation was the first detection of Pluto's atmosphere.

As a graduate student, I did lab work in the reflectance properties of various materials that might be found on planetary surfaces, such as various kinds of dirt, snow or ice. At the time, it was not known whether the light variations of Pluto as it rotates were due to a shape variation or to patches of different materials coming into view. I found that the right proportions of bright and dark materials could predict the variations of Pluto's surface. It will be interesting to see how those calculations from decades ago match up against the real thing.



Artist's conception of New Horizons Spacecraft – Credit: Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

Has any of the New Horizons data informed your work with the Jovian asteroids? Not yet, because we are just starting to get information back. The Nice Model (a scenario for the dynamic evolution of the solar system) predicts that the majority of the Trojans should be similar to small Kuiper belt objects. It will be interesting to see what is really there!

To what degree are you personally anticipating the New Horizons flyby?

I know most of the investigators, so I have a personal interest in things going well and fascinated by what we will learn. We are getting a first look at what was for nearly 100 years the most distant known "planet" in our solar system. Who could not be excited by that?

As a member of the American Astronomical Society, you helped suggest panelists who made the International Astronomical Union's recommendation about Pluto's status as a planet. Will data from New Horizons settle this scientific debate, or is the "planet or not" question something the mainstream media are perpetuating?

Pluto – Credit: NASA-JHUAPL-SWRI

The 2006 vote of the International Astronomical Union was a split decision at the last minute, with most of the astronomers voting having little expertise in planetary science, so there could be grounds for reconsidering it. Objects have been classed as planets and then demoted, like the asteroid Ceres, for example, and objects have first been thought "lesser" (Uranus and Neptune) that are clearly planets. Pluto could go either way.

In a wider sense, it doesn't matter too much what we call Pluto. It is the most well known, soon to be the most studied, member of the solar system's "third zone," the Kuiper belt. Within this belt, icy bodies were probably formed in the region of Jupiter and Saturn and then thrown outward violently in the earliest days of solar system formation. So it is important to study these bodies whether they are planets, dwarf planets, or something else.