



Aspiring astronomers weigh in on the latest in science

PLUTO, ONCE THE solar system's ninth planet, was officially demoted in 2006. But in Michael Mendillo's Cosmic Controversies class, the matter is still up for discussion. In early April, Mendillo stands before his students compiling a list of reasons for Pluto's reprieve.

Mendillo (GRS'68,'71), a College of Arts & Sciences professor of astronomy, doesn't really think that Pluto should be reinstated; he favored its exclusion at the 2006 International Astronomical Union (IAU) conference in Prague and still has the yellow voting card. But in Cosmic Controversies, the version of introductory astronomy he's been teaching with graduate assistant Josh Wing (GRS'11) for two years, questioning

the established wisdom isn't simply encouraged, it's the point. And in Mendillo's mind, there's no better opportunity for evidence-based analysis than the study of the solar system, which changes as new technology enables new discoveries.

"Twenty years ago, when most of you were born, the question of Pluto, the hypothesis of dark matter — these weren't issues at all," he tells his students. "Throughout your life, you'll have things to evaluate. Evidence should be what you use to make a decision."

In Cosmic Controversies, students explore the building blocks of scientific discovery via three still-developing concepts of contemporary astronomy:

dark matter, planets beyond our solar system, and extraterrestrial life. The idea is to demonstrate how astronomy has evolved during their lifetimes and to give them the scientific literacy to understand future changes.

"The conclusion that the majority of our universe is filled with dark energy is a new concept — my students in the 1970s didn't hear about that," Mendillo says. "And evidence of extra-solar-system planets didn't occur in the 1980s. But these students are going to hear about it, and I think they ought to be prepared."

The Pluto controversy, just three years old, is of particular interest to this demographic — more than 1.6 million people have joined the Facebook group called "When I was your age, Pluto was a planet." By the time Mendillo's students reach the topic, they're as well versed in the drama as they are in the facts. That's

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important, he says, because it demonstrates how science and popular belief still clash, 400 years after Galileo published his then-heretical theories of a sun-centered solar system.

"I get yelled at over Pluto every time I get in a taxicab," Mendillo tells his class. "So what evidence made the astronomers take the step that would turn out to be so unpopular? I'd like to present the evidence both

ways, and then we'll have the vote that was held in Prague."

The evidence Mendillo lays out for Pluto's planetary status meets two out of the three criteria set by the IAU in 2006: it orbits the sun and has adequate mass to form a sphere. But is it the dominant gravitational body at its distance from the sun? In 1930, when Pluto was discovered, it appeared to be alone. But modern high-powered telescopes have revealed thousands of large (and sometimes larger) objects nearby.

At the now-infamous IAU meeting, astronomers first weighed increasing the number of planets in our solar system to twelve (and wreaking havoc on the mnemonics used to memorize them). Then they set the current criteria and voted Pluto out. Now, Mendillo puts it to his students: based on the evidence, what is Pluto?

Students say that pondering such questions is an opportunity they hadn't expected from a 100-level science course.

"It's an eye-opener," says

Becky Rosevalt (CAS'10). "This is something you don't get to talk about every day."

"With the whole Pluto thing, I didn't really have the arguments for and against," says Nick Bove (COM'12). "Now I can make my own judgment."

In Prague, Mendillo held up his yellow card to vote. In class, he asks for a show of hands. The final verdict: poor Pluto gets the boot again, 70 to 1. **JU**