

## Solar system masquerade

Call them the great pretenders.

Two solar system wayfarers that mask their true identity—one looks like an asteroid but orbits like a comet, while the other looks like a comet but orbits like an asteroid—were discovered last month.

The first body, dubbed 1996 PW, has the unadorned appearance of an ordinary asteroid and currently lies in the main asteroid belt between Mars and Jupiter. However, Gareth V. Williams of the Smithsonian Astrophysical Observatory (SAO) in Cambridge, Mass., finds that the object has a highly elongated orbit resembling that of a comet.

Williams analyzed images from the Near-Earth Asteroid Tracking team, led by Eleanor F. Helin at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif. The pictures were taken Aug. 9 by an Air Force telescope atop Mount Haleakala, Hawaii.

He calculates that during its 7,000-year orbit, 1996 PW ventures 20 times farther from the sun than Neptune does, journeying through a region of the outer solar system where only comets had been thought to roam. Indeed, a proposed reservoir for comets, the Oort cloud, is believed to inhabit this remote area. If 1996 PW is truly an asteroid, it would be the first one known to traverse comet territory.

Comets display tails when they visit the inner solar system, where the sun's heat turns the ice on their surface into jets of steam that carry light-reflecting dust. It's possible, notes Brian G. Marsden of SAO, that 1996 PW is a dormant comet whose surface ice has been depleted or smothered by dust and dirt.

Alternatively, says Alan W. Harris of JPL, 1996 PW may be just what it appears to be—an asteroid traveling as a comet would. He notes that both comets and asteroids are remnants of material that assembled into planets. Many comets migrated to the fringes of the solar system; a few asteroids may have followed suit, Harris suggests. Scientists haven't observed such an oddball asteroid before simply because asteroids are much rarer than comets in the solar system, he adds.

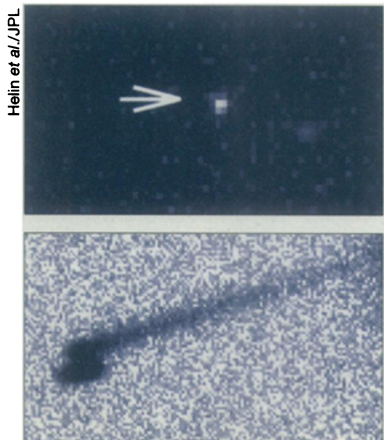
"There's no dearth of explanations to account for this object," Harris observes wryly.

In contrast, he is at a loss to explain another discovery—a body that sports a tail yet orbits as if it were a main-belt asteroid. Eric Elst of the Belgian Royal Observatory in Brussels identified such an object, 1996 N2, by analyzing pictures taken by Guido Pizarro at the European Southern Observatory in La Silla, Chile. The tail points along the body's travel path rather than away from the sun, as comet tails typically do.

Helin has reviewed images taken in 1979 that appear to show 1996 N2 without a tail. One scenario for 1996 N2's acquisition of a tail assumes that the body is an asteroid. The tail might represent dust blasted from 1996 N2's rocky surface during

a recent collision with another asteroid. Harris notes, however, that collisions in the asteroid belt are rare. Observations over the next few months should determine whether the tail changes or even vanishes.

*Comets or asteroids?  
1996 PW (top, arrow)  
looks like an asteroid but  
has a comet's orbit, while  
1996 N2 (bottom) flaunts  
a cometlike tail but stays  
in the asteroid belt.*



## New gene sheds light on cell signaling

Researchers have thought that plant cells miss out on a useful form of communication because their walls block the entrance of large signal molecules. Now, a study on maize plants casts doubt on that theory, scientists report.

Philip W. Becraft of Iowa State University in Ames and his colleagues have found a maize gene, called *crinkly4* (*cr4*), that encodes a previously unidentified receptor, part of which acts as an enzyme. Other plants appear to have these receptors also, Becraft says.

Similar receptors in mammals hook up to large signal proteins, leading the researchers to suspect that the plant counterparts do too. The plant receptors appear to receive signals that alter the growth of seed and leaf epidermis.

Plants that have a mutation in *cr4* are short, with rough, dull, crinkly leaves that tend to adhere to each other as they grow. Epidermal cells of those leaves are unusually large, and some don't lock together like those of normal plants, the team reports in the Sept. 6 SCIENCE.

About 10 percent of the mutant plants' seeds lack aleurone cells, which help break down starch and protein in the endosperm. The seed uses these nutrients as it matures.

Malt manufacturers may have a particular interest in manipulating aleurone development because the aleurone in barley helps starch turn into fermentable sugar, Becraft notes.



*A cr4 mutant maize plant.*

## Noses serve as windows to the brain

"Happy birthday to my nose," Jimmy Durante sang in honor of his prominent proboscis. An even more noteworthy nose is that of the star-nosed mole, researchers contend.

The 22 pink, fleshy appendages fanning out around its diminutive nostrils make up what "may be one of the most sensitive and highly developed touch organs among mammals," Kenneth C. Catania and Jon H. Kaas of Vanderbilt University in Nashville assert in the September BIO SCIENCE. The moles use this organ to find food and navigate their world.

The area of the mole's cortex that handles information picked up by this sensory organ is readily apparent in the arrangement of nerve cells in brain tissue. "You can see a star pattern in the brain," explains Catania.

To identify food, the moles rely on one of the smaller nose appendages. Neurons that process information from this part of the nose take up a large proportion of the cortical area devoted to touch. This finding shows that an organ's importance, not its size, may determine how much space it gets in the brain, Catania says.

*A star-nosed mole,  
Condylura cristata, is  
as small as a mouse.*

