

Extrasolar planets emerge from the dark

Last month, two landmark discoveries drove home the message that some of the stars closest to our sun may harbor planets. One group of astronomers inferred the presence of a large companion to the sunlike star 51 Pegasi, which lies 42 light-years from Earth. A second team went beyond inference, directly imaging a faint object—either a heavy-weight planet or a failed star—adjacent to an even closer neighbor, the low-mass star GL229 (SN: 10/21/95, p.260).

Now, follow-up analyses as well as new observations have begun to shed more light on both findings. Two research teams report hints that a second planet may orbit 51 Pegasi. Another team has used the Hubble Space Telescope to make a sharper image of the massive body circling GL229.

In the Nov. 23 *NATURE*, Michel Mayor and Didier Queloz of Geneva Observatory in Sauverny, Switzerland, provide further details about their indirect detection of a planet orbiting 51 Pegasi. In tracking the star's velocity along the line of sight to Earth, the researchers detected a periodic wobble. They ascribe this back-and-forth motion to the tug of an unseen, Jupiter-mass companion. Whipping around the star every 4.2 days, the body ventures 100 times closer to 51

Pegasi than Jupiter does to the sun.

Mayor and Queloz suggest that the object is either a planet or, less likely, a brown dwarf that 51 Pegasi has stripped of 95 percent of its mass. Brown dwarfs form as stars do but lack the mass to sustain nuclear burning. In either case, astronomers have calculated that, despite its proximity to 51 Pegasi, the companion will not burn up.

The companion's origin has proven more difficult to explain. If the object, dubbed 51 Pegasi B, is a planet, researchers are hard-pressed to understand how it could have formed so close to its parent star. Doug N.C. Lin of the University of California, Santa Cruz proposes that 51 Pegasi B originated much farther from its parent. He suggests that it spiraled inward as it gradually gave up angular momentum to the disk of gas and dust from which it arose. In this scenario, other planets that haven't lost as much angular momentum should reside at greater distances from the star.

That prediction dovetails neatly with a second, far more tentative finding from the Swiss team. The researchers report evidence of a smaller wobble, which could signify a second, more distant planet with a lower mass and an orbital period greater than 18 months.

Queloz cautions that he and Mayor haven't studied Pegasi 51 long enough to determine whether this long-term wobble repeats itself, as it must if a planet is the culprit. Last month, other astronomers announced that they had found a hint of a similar wobble, using a spectrograph at the Oak Ridge Observatory in Harvard, Mass.

The data "could mean that 51 Pegasi actually has a system of planets," notes Gordon A.H. Walker of the University of British Columbia in Vancouver. "Now that would be exciting indeed!"

Shrinivas Kulkarni of the California Institute of Technology in Pasadena had a similar planet system in mind when he examined images of GL229 and its surroundings taken on Nov. 17 by Hubble. Kulkarni and his colleagues had previously used a ground-based telescope to image in the near-infrared an object 20 to 50 times as massive as Jupiter. This body lies farther from its star than Pluto does from the sun.

Hubble didn't find any bodies closer to GL229, but the telescope did take several high-resolution images of the recently discovered object, including the first in visible light, he told *SCIENCE NEWS*. Hubble observations planned for 6 months from now should reveal whether or not the faint body, believed to be a cool brown dwarf, truly orbits GL229, Kulkarni says.

— R. Cowen

Weight loss, less salt avert hypertension

Eating less salt and losing weight can stave off high blood pressure, according to a study of people at high risk of developing this condition, known as hypertension.

"Most people are going to develop hypertension at some point," says study leader Paul Whelton of Johns Hopkins Medical Institutions in Baltimore. "We need to show people how they can prevent it."

Nearly two-thirds of the U.S. population will eventually suffer high blood pressure, but doctors can control the condition in only 21 percent of patients. Preventing hypertension could cut the 1.5 million heart attacks and 500,000 strokes in the United States each year.

The researchers studied 2,382 overweight men and women with "high normal" blood pressure—above the average 120 millimeters of mercury (mm Hg) over 80 mm Hg, yet below the high blood pressure cutoff of 140 over 90. Blood pressure is recorded as systolic pressure, during contractions of the heart, over diastolic pressure, between heartbeats. Nearly 80 million people in the United States register in the high normal range.

Volunteers not assigned to a control group were counseled to lose weight, cut salt from their diet, or do both. After 6 months, people in the three study

groups had, on average, lost 10 pounds, reduced sodium intake 25 percent, and seen a drop of 4 mm Hg in systolic pressure and 3 mm Hg in diastolic pressure. Whelton estimates that every 2 mm Hg decrease in diastolic pressure decreases heart attacks by 6 percent and strokes by 15 percent.

As he reported at the American Heart Association annual meeting in Anaheim, Calif., last week, maintaining those health gains wasn't easy. After 36 months, participants averaged only a 1 mm Hg drop in systolic blood pressure, with no decrease in diastolic blood pressure, and had regained 5 to 6 pounds. Nonetheless, 20 percent fewer people developed hypertension in the study groups than in the control group.

Whelton notes that 80 percent of the sodium in U.S. diets comes from prepared foods and argues that health professionals "have to work with manufacturers to lower sodium."

Jeffrey Cutler of the National Heart, Lung, and Blood Institute in Bethesda, Md., says the institute is encouraging the food industry to reduce sodium and calories. Cutler maintains that "the potential is there to prevent probably the majority of the cases of hypertension with these 'simple' lifestyle changes."

— L. Seachrist

Panel OK's diet drug

Obese people in the United States may soon have another weapon in the battle of the bulge. An advisory panel to the Food and Drug Administration voted 6-5 last week to approve for sale the diet drug dexfenfluramine.

In September, Interneuron Pharmaceuticals of Lexington, Mass., told the panel that dexfenfluramine, in conjunction with a diet, helped 40 percent of people studied to lose up to 10 percent of their body weight—double the amount lost through diet alone. But the panel postponed its decision on the drug because of concerns that long-term use could cause brain damage and pulmonary hypertension.

Like eating carbohydrates, the drug works by causing a surge of serotonin in the brain, thus making people feel full even though they have eaten less.

The FDA usually follows the recommendations of its scientific advisory panels. However, the agency has yet to announce when it will act on the dexfenfluramine recommendations.

Dexfenfluramine has been available for 10 years in Europe and is currently available in 65 countries. If approved by FDA, it will be the first new anti-obesity drug in the United States in more than 20 years.

— L. Seachrist