

A dozen new planets . . . and still counting

Just last month, the number of known planets orbiting stars similar to the sun stood at 10—one more than within the solar system (SN: 8/8/98, p. 88). The official count has now risen to an even dozen, with the likelihood that several other candidate objects will soon boost the population to 15 or 20.

"We may be announcing a new planet every 2 months," says R. Paul Butler of the Anglo-Australian Observatory in Epping, Australia. Too dim to be seen, planets betray their presence by their tug on the stars they orbit.

In a separate study, new images of dust around one star indicate that it hosts a full planetary system rather than a single planet.

The two latest planets, which Butler announced at the Carnegie Institution of Washington (D.C.) on Sept. 9, each have a special niche. A planet orbiting the star HD210277, discovered by the Keck 1 Telescope atop Hawaii's Mauna Kea, is the first whose average distance from its parent star is nearly the same as Earth's distance from the sun.

Often used as a yardstick, the Earth-sun separation is defined as 1 astronomical unit (AU). The new planet lies at an average distance of 1.15 AU from its host star. The planet is far heavier than Earth, at least 1.36 times as massive as Jupiter, and has a much more elongated orbit. The planet ventures closer to its host star than Venus' average distance from the sun and farther away than Mars' average distance. The parent star is 68 light-years from Earth.

The other new planet, orbiting the star HD187123, is closer to its host than any other planet found so far. The star is 156 light-years from Earth. Butler and his colleagues, including Geoffrey W. Marcy of San Francisco State University and the University of California, Berkeley, will report details in *PUBLICATIONS OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC*. The orbiting body, which has at least half the mass of Jupiter, whips around the star once every 3.095 days and lies 0.042 AU from its parent, one-ninth the average distance of Mercury from the sun.

That makes the object a real hotty—along with three other recently found planets that orbit within the blistering outer atmosphere of their host stars. Like all planets, these objects arose from disks of gas, dust, and ice that surrounded the parent stars in their youth. According to a popular theory, massive planets arise at Jupiterlike distances from their star and can migrate inward by flinging material toward the outer part of the disk. This suggests that stars with migrating planets have unusually dusty disks that should be easy to detect.

That's just what David E. Trilling and

Robert H. Brown of the University of Arizona in Tucson found when they examined the region surrounding the star 55 Rho¹ Cancri, already known to harbor a closely orbiting planet.

Using NASA's Infrared Telescope Facility atop Mauna Kea, the researchers blocked out the star's bright light and spied a dusty disk extending at least 40 AU from the star. That's roughly the same distance at which the Kuiper belt, the solar system's reservoir of dusty comets, lies from the sun. The disk around 55 Rho¹ Cancri, however, appears to contain about 10 times as much material. The excess, says Trilling, "is a nice confirmation of the theory . . . that the planet migrated in" and pushed dust out.

Progesterin enhances an anticancer process

Taking birth control pills for a few years decreases a woman's risk of getting ovarian cancer later in life. With egg release stopped, the ovaries' outer lining undergoes less wear and tear, which scientists have theorized makes abnormal cell growth less likely.

Indeed, a woman who takes birth control pills for only 3 years—less than 10 percent of the typical 40 years of fertility—can lower her ovarian cancer risk by 30 to 50 percent, studies have shown. This surprising level of benefit led scientists at Duke University Medical Center in Durham, N.C., to suspect that the pills, besides preserving the ovarian lining, can trigger some process that actively thwarts cancer.

The researchers now find that cynomolgus macaque monkeys getting the hormone progesterin had a high rate of programmed cell death in their ovaries. This process, called apoptosis, allows the body to dispose of cells damaged beyond repair—a function necessary to avoid aberrant cell growth that can lead to cancer. Disruption of apoptosis has been seen in other cancers.

The new findings indicate that progesterin enhances apoptosis, which may explain some of the protection that birth control pills impart, says study coauthor Gustavo C. Rodriguez, a gynecologic oncologist at Duke.

The researchers gave 55 female monkeys oral contraceptives containing a synthetic version of the hormone estrogen, progesterin, or both. Twenty other monkeys receiving no contraceptives served as a control group.

After nearly 3 years, ovarian lining from the monkeys getting the contraceptives that contained progesterin showed significantly more apoptosis than tissue from the control group or the estrogen-only group. About 3.9 percent of ovarian cells in the control group and 1.8 percent of cells in the estrogen-only group were

"Although I haven't seen the data . . . the explanation seems very plausible to me," says Michael Jura of the University of California, Los Angeles.

"We're trying to be very cautious," Trilling adds, "but a Kuiper belt is almost certainly what we're looking at." The disk, which may represent debris from the formation of several planets, is the first seen around a middle-aged, ordinary star, he says. "There's real evidence that this is a fully mature planetary system."

The team plans to unveil an image of the disk next month at a meeting of the American Astronomical Society in Madison, Wis. A description of the team's work appears on the Web site "The Extrasolar Planets Encyclopaedia" (<http://www.usr.obspm.fr/departement/darc/planets/encycl.html>).
—R. Cowen

undergoing apoptosis, compared with 24.9 percent of cells in the progesterin-only group and 14.5 percent in the monkeys getting a birth control pill containing both hormones, the researchers report in the September/October *JOURNAL OF THE SOCIETY OF GYNECOLOGICAL INVESTIGATION*.

"This is interesting, but it needs to be confirmed with more control animals," says Gabriel Nuñez, a pathologist and molecular biologist at the University of Michigan Medical School in Ann Arbor. He notes that ovaries were taken from the control group at random times during the monkeys' ovulatory cycles, so the tissue samples presented a range of apoptotic cell counts, blurring the comparison.

Rodriguez notes that while the controls' apoptosis readings did range widely, most of these tissue samples came from monkeys in the phase of their monthly cycle that follows ovulation. The ovaries are then secreting a natural form of progesterin called progesterone. Despite that, "we still see significantly more apoptosis in the monkeys that had received birth control pills with progesterin," he says.

The new apoptosis data complements a theory that attempts to explain why 140,000 women die of ovarian cancer worldwide every year. Without contraceptive pills, the string of monthly ovulations in a woman's fertile years is usually broken only by pregnancy and breast feeding. These respites lessen ovarian lining damage. But as women have fewer children, they ovulate more times. The body repeatedly makes eggs, thrusts them out of the ovary, and then repairs the breach (SN: 7/5/97, p. 7).

"We're not doubting that this disruption and repair increases the cancer risk," Rodriguez says. However, he believes that progesterin's ability to promote apoptosis in the ovarian lining could represent an additional protective effect of oral contraceptives against cancer.—N. Seppa