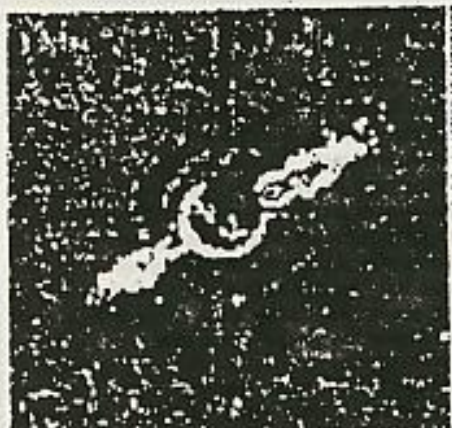


Science



Beta Pictoris: a solar system like the sun's

New Neighbors

Hints of other planets

Peering out across the broad, lonely wastes of space, scientists have long wondered if there were intelligent beings on other worlds. Now two astronomers have found strong evidence that planets like earth and its eight celestial cousins in the sun's solar system may be common in the Milky Way. In a new, highly detailed photograph of Beta Pictoris, a neighborly 293 trillion miles from the sun, Bradford Smith of the University of Arizona in Tucson and Richard Terrile of the Jet Propulsion Laboratory in Pasadena, Calif., have discovered that the star is encircled by a dim disc of gas and solid particles. The astronomers believe that those particles may be the signs of newborn planets and worlds in formation. The spectacular image is the first visual evidence of another solar system, raising the possibility that extraterrestrial life may some day be found. "The time will have to come when we realize that we're not the center of the universe," says Terrile. "The galaxy may be teeming with life. There may be millions of civilizations."

The finding was not entirely unexpected. A team of scientists at the Jet Propulsion Lab that analyzed emanations of heat from the orbiting infrared astronomy telescope (IRAS) announced last spring that four nearby stars appeared to be surrounded by some kind of matter. At the Cerro Las Campanas Observatory in central Chile, Smith and Terrile trained a 100-in. telescope on one of those stars, Beta Pictoris, which was then visible high in the sky. Taking a photograph, however, turned out to be extremely difficult. Beta is twice as bright as the sun, and its light easily overwhelms that from any faint material around it. Trying to discern the surrounding matter, says Terrile, was "like trying to see a match next to a flashbulb."

The two scientists finally employed an instrument called a coronagraph, which can block out the most blinding

light of a star, making a kind of eclipse. With Beta in shadow, Terrile and Smith then attached a special detector to the telescope that picked up the weakest light signals around Beta. The resulting image of an encircling disc looked remarkably similar to our own solar system. Analyzing the configuration of the disc with a computer, they found that some matter may have condensed to form planets.

Terrile and Smith point out that if a Beta planetary system does exist, it is an unlikely place to find galactic citizens: the distant network is only about 100 million years old, in contrast with the 4.5 billion years of earth. The most primitive form of life did not appear on earth until 1 billion years later. Some astronomers, moreover, are skeptical of the pair's planetary speculation. Says Fred Gillett of the National Optical Astronomy Observatories in Tucson and a member of the IRAS team: "It would be impossible, using this technique, to detect large bodies."

Smith and Terrile are now busy photographing three other stars known to have surrounding matter, including one thought to be almost as old as the sun. By the end of the year, the IRAS team will release the names of 40 more stars that they believe may be girdled by solid material. Says Jet Propulsion Laboratory's chief space scientist, Moustafa Chahine: "If you can imagine what Galileo was thinking when he first looked at Jupiter, and where we are now, it can give you an idea of where we'll be in the very near future. We have to start thinking about making an interstellar visit."

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As if their spectacular Beta slide show was not enough, Terrile and Smith presented another dazzling photograph last week from the Las Campanas Observatory. This one was of objects closer to home: the first clear image of the rings around Uranus, the third largest planet in the solar system and the seventh farthest from the sun. The rings were first discovered in 1977, when Uranus passed in front of a very bright star and repeatedly dimmed that distant sun's light. Scientists soon decided that the peculiar smudging was caused by the planet's nine rings, the largest of which is 63,600 miles in diameter.

Unlike the glittering braids around Saturn, which are composed of strands of ice fragments, the Uranus rings are dark, reflecting only 2% of the sunlight that strikes them. Astronomers theorize that these somber necklaces are made either of a kind of carbon material, scavenged from the outer edges of the solar system and much less reflective than charcoal, or of frozen methane gas that has been blackened after long exposure to a radiation source. Says Terrile: "There might be a trapped radiation field around Uranus, just as there is around earth and Jupiter." Final answers may have to wait until 1986, when the Voyager 2 spacecraft, launched in 1977, will swing past Uranus to get a better view.

—By Natalie Angier.
Reported by Meg Grant/Los Angeles