

Image of a Planet: Too Hot to be True?

"Hubble takes first image of possible planet around another star and finds a runaway world." That was the title of a headline-making press release issued by NASA 13 months ago. At a space agency briefing in May 1998, astronomer Susan Terebey of the Extrasolar Research Corp. in Pasadena, Calif., unveiled Hubble Space Telescope images that she said might show a planet born to a pair of stars 450 light-years from Earth (SN: 6/6/98, p. 357).

Although astronomers roundly criticized NASA for highlighting an extremely tentative finding, the stakes were admittedly high. The images could go down in history as the first ever of a planet outside the solar system.

Now, several astronomers have told SCIENCE NEWS that new data reported by Terebey at two recent meetings strongly suggest that the object is too hot to be a planet. Instead, it is "almost certainly a normal reddened star," says Keith S. Noll of the Space Telescope Science Institute in Baltimore.

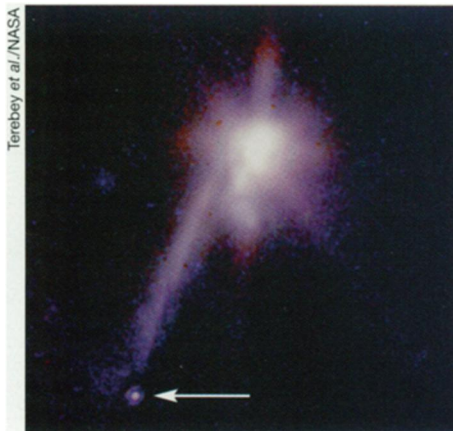
Terebey told SCIENCE NEWS that she would not talk to reporters until July. By then, she said, she will have had time to assimilate comments from scientists who had seen her new data and submit an article to a peer-reviewed journal.

According to astronomers who attended her latest presentations, Terebey acknowledged that the spectrum she has obtained of the faint object, dubbed TMR-1C, could be that of a star. However, she also suggested that the object might be a failed star, known as a brown dwarf, or it could still be a planet—though hotter and possibly younger than she had thought.

Terebey's spectrum was taken at the Keck Telescopes atop Hawaii's Mauna Kea. She presented the data on June 9 in Flagstaff, Ariz., at a meeting on giant planets and cool stars and on June 17 at a Gordon Research Conference in Henninger, N.H., on the origins of solar systems. Analyzing the Keck data was hard work because the object was so dim, she previously told SCIENCE NEWS.

Examining a faint dot in Hubble images, Terebey and her colleagues last year were intrigued by the object's location, at one end of a bright trail that led to a pair of young stars. The team suggested that the newborn stars were themselves parents and the faint object their offspring, a planet a few times as massive as Jupiter that had been expelled from its birthplace.

The luminous trail, Terebey proposed, was generated by the planet as it barreled into space and pushed dust out of its way. In her team's original scenario,



Proposed planet (arrow) could be just a star.

the planet was about as old as its parents, a few hundred thousand years, and at a relatively cool temperature—no more than 1,500 kelvins.

Terebey's spectrum reveals that the object does not contain water vapor, which should be present if its temperature is lower than 2,500 kelvins, notes Noll. His analysis of Hubble images already hinted at that. Because water is abundant in the cosmos and straightforward to spot in spectra, its absence is a reliable indicator of a high temperature, he adds.

Terebey showed that the spectrum of an ordinary, low-mass star, partly obscured by foreground dust, roughly matches her Keck spectrum of TMR-1C, according to astronomers who heard her Flagstaff presentation.

This "implies strongly" that TMR-1C is just a background star, says Mark S. Marley of New Mexico State University in Las Cruces, an organizer of the Flagstaff meeting. "It is a real stretch of the data to claim anything else."

Still, Terebey told astronomers that it's possible that TMR-1C is a young planet that's hot because it has just formed or is packing on new material as it travels.

Peter Bodenheimer of the University of California, Santa Cruz says that in the unlikely event that the object is a planet, it would have a very different origin from that originally proposed. The trail would have created the planet, instead of the planet having created the trail. He suggests that the planet condensed out of the trail's material, which was ejected from the disks of matter surrounding each of the parent stars.

James W. Liebert of the University of Arizona in Tucson, who also attended the Flagstaff meeting, said it's plausible that planets heavier than Jupiter could be ejected as a solar system forms and

stabilizes. "[But] if the object really were of planetary mass, the nature of the possible ejection event is so unclear [that] I wouldn't necessarily expect that it would have a 'normal' temperature and spectrum for something of that age," he adds.

Noll says, "In my opinion, it is a waste of time and bad science to keep pursuing this idea [of a planet] when a much simpler and more likely alternative—a star—is supported by all the evidence."

Liebert adds that a simple test, one that Terebey suggested last year, could settle the matter. If the object is indeed a planet thrown out by its birth parents, it should be traveling at a fair clip. "Either it keeps on moving . . . or it is a [star], which does not move," Liebert says. Tracking the faint body with a telescope for several years should provide the answer, he concludes.

—R. Cowen

Cows' milk, diabetes connection bolstered

Many studies have linked cows' milk consumed by babies to subsequent diabetes, but some researchers still doubt that it causes the disease. The association is based on animal experiments, they note, or indirect evidence (SN: 10/19/96, p. 249), such as studies in which parents of diabetic children try to recollect when their babies first started drinking milk-based formula.

Now, Finnish researchers have avoided the vagaries of poor recall by studying children from birth. In so doing, they have added to the case against cows' milk.

By monitoring babies in diabetes-prone families, the scientists find that infants getting formula that includes cows' milk are more likely later to develop the immune reactions associated with juvenile-onset, or type I, diabetes than are babies getting a substitute. The scientists reported the findings this week in San Diego at the 59th Annual Scientific Sessions of the American Diabetes Association.

The researchers tracked, until age 8 months, 173 newborns in Finland who had a close relative with type I diabetes. To augment their mothers' milk, half of these babies received milk-based formula and the rest got a formula in which the cows' milk proteins had been broken into fragments called peptides. The two formulas taste and smell the same, so parents and researchers didn't know which one a baby was drinking.

Babies' immune systems largely ignore cows' milk proteins that have been chopped up. However, contact with one