The Pole Star stops pulsating

Nigel Henbest

The POLE STAR is changing rapidly from a star that pulsates into one that is stable, according to astronomers in Canada. This discovery confirms theories that stars vary in brightness during only a small portion of their lifetime.

Astronomers at the University of British Columbia, Vancouver, first began to suspect that the Pole Star was changing in 1987. They say we are very fortunate to catch the change, because the Pole Star has been pulsating for around 40,000 years and theory predicts that its pulsations should die away in a period of only 10 years.

The Pole Star, known officially as Polaris, has always been a favourite target of astronomers because it is immediately above the North Pole, and so its position remains fixed in the sky as the Earth turns. In the mid-19th century, however, astronomers discovered that although its position was constant, its brightness was not: it varied slightly.

Later, when astronomers measured the spectrum of the Pole Star, they found that the spectral lines shifted in wavelength periodically. This was due to the doppler shift, and it indicated that at times the surface of the star was moving towards us while at other times it was moving away. In fact, the entire star was pulsating in and out every four days.

Astronomers now know that the Pole Star is a member of a class of pulsating stars known as Cepheid variables. In the stars, the slow vibrations are maintained by energy which is trapped below the surface in a layer of ionised helium. According to the standard theory of Cepheid variables, the pulsations die down as the star gradually expands and its surface grows cooler. When the helium layer ends up too deep within the star to drive the pulsations, they stop altogether.

According to astrophysicists, the Pole Star’s temperature and size suggest that it has reached the stage at which its pulsations will soon cease. The standard theory says the pulsations should die away in the space of about 1000 pulsation cycles—about 10 years in the case of Polaris.

The pulsations of Polaris have been roughly constant, from the time the first measurements were recorded in 1896 until the 1950s. The maximum change in speed as the surface pulsed in and out has stayed at 5 kilometres per second. But in the early 1980s, several astronomers noted that the pulsations seemed to be less pronounced. However, their measurements were not very precise.

In 1987, astronomers at the University of British Columbia, who specialise in measuring the pulsations of stars, set an undergraduate the project. The project was to measure the pulsations of the Pole Star, using a small 0-4-metre telescope located in the middle of the university campus.

Nadine Dinshaw, an undergraduate stu-

Do chimps chew leaves as drugs?

WILD CHIMPANZEEs may use herbs for their medicinal properties, according to two biologists. Paul Newton of the University of Oxford and Toshisuda Nashida of the University of Kyoto, Japan, came to this conclusion after observing the way in which chimpanzees in Tanzania eat the leaves of certain plants. They claim they may be using the plants as medicine (Animal Behaviour, vol 139, p 797).

The plants that the chimpanzees eat include Aspilia and Lippia plicata. Both are used by local people because of their pharmacological properties. The chimpanzees take each leaf and massage it between their tongue and inside of the cheek. Only when they have done this do they swallow the leaf—whole.

Newton and Nashida say that what the chimpanzees are doing is very similar to the way people take certain drugs. Doctors administer some medicines to be sucked under the tongue or between the cheek and the tongue.

Newton and Nashida also find that the chimpanzees eat the leaves of Aspilia and L. plicata plants in the morning. In contrast, the animals do most of their other foraging in the afternoon. The biologists think they can explain this. They claim that the chimpanzees are replenishing the level of a drug which has declined overnight. Alternatively, they say, the animals are starting the day with a stimulant—the chimpanzee equivalent of a cup of black coffee.

Georgia Mason