

‘Spin off’ of Venus in transit

A dip in a star’s brightness may mean a planet is passing in front of the star, says S.Ananthanarayanan.

The great difficulty in the hunt for planets in star systems other than our own is that any possible planets would be too dim, and tiny, to be seen. But if the planets passed in front of the star, then they may give themselves away by a slight dip in the star’s brightness.

Transit of Venus

June 8th 2004 was a red-letter day for astronomers, as the blue planet passed through the direct path between the sun and the earth. This was a rare event, as the planes of revolution of Venus and the earth are not the same but at an angle. Thus, unlike Mercury, which passes before the sun a few times every century, Venus does this at the irregular intervals of 8, 121.5, 8 and then 105.5 years. The next transit will happen on 6 June 2012, but the one after that will not come about until December 2117.

The transit itself appears as a dot, which is Venus, moving past the bright disk of the sun. As we have good estimates of the speed of Venus and its distance from the earth, the transit has been of great interest in being a way of estimating the distance from the earth to the sun.

But now, there is also interest in observing the slight dip that is expected in the brightness of the sun as Venus rushes past.

Other star systems

The main difficulty in spotting a planet in a distant star system is that the ‘glare’ of the star will not permit the dim, reflected light from the planet to be seen. Planets have thus been ‘observed’ or detected only by the ‘wobble’ of the star, as the planet swings around. The star goes through a slight to and from motion, to balance the movement of the planet, and the movement of the star shows up as changes in the colour of the light emitted. The motion of the star is something like the ‘wobble’ of a hammer thrower as he swings the ball around for the throw. This makes the star move, now towards the earth and then away from the earth. The change in colour is like the change in the shrillness of a railway engine’s whistle as it approaches and then speeds away from a listener as it rushes past. The light from the star should thus shift a little to the violet end, and then a little to the red end. But as the motion of the star is usually almost negligible, this method works only for comparatively large planets, which can cause a sizeable ‘wobble’.

But if the transit of a planet causes a change in the brightness of the star, then this may be another way to spot planets. The slight reduction of the light reaching us, because of the tiny obstruction, in fact, can be detected by sensitive instruments aboard orbiting observatories. Astronomers at the European Space Agency had prepared to make observations of the transit of June 8 to check out the predicted drop of 0.0076% in the intensity of the sun’s light reaching the earth.

appeared in 2003