

Do other stars have planets too?

A being on a distant star looking our way would not see the planets of our system, says S.Ananthanarayanan.

The being would see the sun, as a star, but the reflected light from planets would be too dim in the comparison with the brightness of the sun.

Other planet systems

Scientists are interested to know if other stars, like our sun, have planets that go around them. But they face the same difficulty – that the dim light from the planets cannot be made out in the glare of the star. But we have still been able to detect about 120 stars that do have planets in orbit.

The method used is indirect. A star with a planet going around it is something like a hammer thrower turning round to throw the hammer. While the hammer goes round and round, the thrower also leans back and his centre of mass goes round in a smaller circle. In the same way, a star with a planet also goes around in a small circle. It is this small motion of the star that is detected, to help us gather that there must be a planet out there, to make the star wobble like that!

How do we detect the tiny motion of a distant star? Again, this is indirect. When a star is in motion, the colour of light from the star changes slightly, depending on which way the star is going. This is like the whistle of a railway engine becomes more or less shrill as the engine comes towards or moves away from us. In the spectrum of the light from the star are ‘markers’, dark lines where some colours have been absorbed by elements in the star’s atmosphere. If the star is wobbling, these dark lines also shift, in the spectrum and this gives away the motion of the star.

The planets’ own light

This method of detecting planets is good only for huge planets because smaller planets cause hardly any ‘wobble’. And anyway, there is nothing of the planet itself that is coming in view. Scientists have now found that the heat emitted by the planet may be easier to detect than reflected light. In the case of the hottest stars, known as white dwarfs, the energy being emitted is almost all in the visible or even the ultra violet range. If the planet were radiating in the infrared range, the planet may not be so ‘dim’ in the infrared!

A few months ago the orbiting Hubble Space Telescope took remarkable infrared pictures of what may be an extra-solar planet. The telescope’s infrared detectors were trained on to seven known white dwarfs. Three of the stars had an object close to them, like a planet. Two of the objects seemed too large for planets but the third was a likely candidate.

More recently, a group of scientists at the European Southern Observatory at Paranal Mountain in Chile, used infrared telescopes and spotted another possible planet orbiting a small, faint star

about 230 light years from the earth. It is the start of a new field of astrophysics – imaging and studying the spectra of distant planetary systems!
