How Do We Find Exoplanets?

Since planets are close to much brighter stars, how do we actually find them?

Some planets are found by a technique that uses Einstein’s theory of general relativity, observing the bending effect of gravity from a hidden planet as it warps the light around its host star.

The most common method is to look for an “eclipse” or “transit” as a planet passes in front of its host star. This is how the Kepler observatory found planets, by staring at a large region of the sky and waiting for planets to pass in front of their stars, taking snapshots every second. The Transiting Exoplanet Survey Satellite uses the same technique on our nearest neighbor stars.

Another technique observes very small changes in the star’s position in the sky, the “wobble” that occurs when an unseen planet’s gravity tugs on its host star. If the planet and star are oriented so that the star is moving toward or away from us, instead of side to side, we can detect the planet as a shift in the star’s light.

As far as getting pictures of the actual exoplanets themselves, it’s possible, but very difficult. The telescope has to block the bright star’s light to reveal the faint planet nearby.