

"Super-Earth" Found

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A newfound planet orbiting close to the red-dwarf star Gliese 581, depicted in this illustration, is close to Earth in size and at the right temperature for liquid water.

European Southern Observatory

To date astronomers have detected more than 220 planets around other stars, but their search for one that's truly "Earthlike" — relatively small, temperate, and potentially habitable — has proved elusive. Yesterday, however, a team from Geneva Observatory in Switzerland announced the discovery of an exoplanet that's the smallest yet around a normal star and likely a close match to ours.

The newfound planet has a minimum mass just five times that of Earth and a diameter perhaps 50% larger, meaning gravity at the surface would be about twice as strong.

This "super-Earth" circles the star Gliese 581 every 13 days at a distance of just 11 million kilometers (7 million miles). That's just 7% of the Earth-Sun distance, and if the host star were truly Sunlike the planet would be broiling hot. But Gliese 581 is a red dwarf (spectral type *M3*), considerably smaller, cooler, and dimmer than the Sun.

This means the new planet orbits within the star's "habitable zone." According to Stéphane Udry, who led the discovery team, its mean temperature is probably between 0° and 40° Celsius (30° and 100° F), so any water on its surface would be liquid. Moreover, notes Udry, "Models predict that the planet should be either rocky — like our Earth — or fully covered with oceans."

Udry's team discovered the new planet, designated Gliese 581c, by detecting the repetitive wobble that its gravity induces in the star during each orbit. This wobble alters the star's motion toward and away from Earth by only 2 to 3 meters per second, which creates a Doppler shift in the stellar spectrum near the current limit of detectability. The team observed Gliese 581 using the European Southern Observatory's 3.6-meter reflector at La Silla, Chile, together with an ultra-precise spectrograph called HARPS.

Located in the constellation Libra at a distance of 20.5 light-years, 11th-magnitude Gliese 581 is one of the 100 nearest stars. Its other [two known planets](#) have masses two or three times that of the newfound super-Earth.

The team has submitted its findings to the European journal *Astronomy and Astrophysics*. More details of the discovery are available from the ESO's [press release](#).

Links referenced within this article

two known planets

<http://exoplanet.eu/star.php?st=Gl+581>

press release.

<http://www.eso.org/outreach/press-rel/pr-2007/pr-22-07.html>

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