

PROXIMA B – Our Newest Neighbour

By Henry M. Holden

IN THE last 25 years, scientists have discovered thousands of new worlds called “exoplanets” orbiting distant stars. Recently scientists have discovered a previously unknown exoplanet virtually under our noses.

In a paper published in a recent issue of *Nature*, researchers say that they have positively identified a planet about 1.3 times the size of Earth orbiting the red dwarf star Proxima Centauri, 4.2 light years away. Proxima Centauri is our solar system’s closest neighbour. The star maybe “nearby”, but it is actually so far away that it can only be seen as a small red dot in most telescopes.

A planet’s gravity can physically move a star it orbits despite the size difference between them. The researchers observed the star over long periods of time. As the planet circles, the star wobbles. This slight movement can be detected as a slight change in the colour of the star light. The light shifts slightly towards blue then slightly towards red as the star moves toward and away from us over and over.

They found this cycle, in a planet they have named “Proxima b,” repeats once every 11.2 days. The planet is at a distance of 4,66-million miles (7,5 million km), or about five percent of the distance between the Earth and the Sun. For comparison, Mercury orbits the sun at an average of 35,98-

million miles.

The light from the star shifts ever so slightly, a variation called a Doppler shift, during which the star appears to be moving towards Earth slightly and then away from Earth slightly. That wobble indicated the presence of a planet.

“Once we established that the wobble was not caused by star spots, we knew that there must be a planet orbiting within a zone where water could exist, which is really exciting,” said John Barnes, a co-author on the paper. “If further research concludes that the conditions of its atmosphere are suitable to support life, this is arguably one of the most important scientific discoveries we will ever make,” he said.

“It’s not only the closest

planet to our solar system, it’s the closest planet outside of our solar system that will ever be found,” said astrophysicist, Ansgar Reiners, one of the authors of the paper.

Researchers pointed out that the planet orbits the star in an area that might be considered the Goldilocks or habitable zone. If Proxima b has an atmosphere and liquid water, it might be hospitable to life. Because its star is seven times smaller than our Sun, and much cooler, there is a chance surface water exists.

On the other hand, if the planet had an atmosphere, there’s no guarantee that it still does. When Proxima Centauri was more active, it is possible the star could have blown away Proxima b’s atmosphere early on

in its development.

“We won’t know more until new data comes in from other observations, and potentially even future telescope and other missions to study Proxima b,” said Barnes.

Getting to Proxima Centauri may take some time. While it is the closest star, 4.24 light years, it is still a very long way, and getting there would take thousands of years with our current technology.

Until we develop some awesome warp-type propulsion system that allows us to launch a robotic or manned mission to Proxima b, we will have to rely on telescope-based observations to tell us more about what our closest neighbour really looks like.. →



Artist's Impression of the exoplanet Proxima Centauri b, the closest exoplanet to the Sun and also the closest potentially habitable exoplanet as well. The Alpha Centauri binary system can be seen in the background. (Credit: ESO/M. Kornmesser)