

Building an Earth?

Is an Earth-like planet forming 424 light-years away in a star system called HD 113766? New observations of this far-away system from NASA's Spitzer Space Telescope has some astronomers saying, yes. Hello, I'm Daniel Brennan.

This Spitzer Space Telescope podcast is part of a series highlighting recent discoveries in infrared astronomy. It's produced by NASA's Spitzer Science Center at the California Institute of Technology in Pasadena. The Spitzer mission is managed by NASA's Jet Propulsion Laboratory.

We may be one step closer to the elusive goal of finding Earth-like planets around other stars. But for this one, we'll have to wait a while.

According to Dr. Carey Lisse, of the Applied Physics Laboratory at Johns Hopkins University, in Baltimore, Md. all the pieces for forming an Earth-like planet seem to fit together in case of star system HD 113766.

It contains a huge belt of warm dust – enough to build a Mars-size planet or larger. The belt is currently clumping into the beginnings of a rocky planet; and all this is happening right in the middle of the system's terrestrial "habitable zone." This is the region around a star where liquid water could exist on any rocky planets that might form.

In addition to being in the right location, this dusty belt is also swirling around the right star – one that is just a little more massive than our Sun. Lisse notes that HD 113766 is also just the right age for forming rocky Earth-like planets, at approximately 10 million years old. If the system were too young, its planet-forming disk would be full of gas, and it would be making gas-giant planets like Jupiter. If the system were too old, then dust clumping would have already occurred and all the system's rocky planets would have already formed.

But, there is more to forming an Earth-like planet than just being in the right place at the right time and around the right star – it's also about the right mix of dusty materials.

Using Spitzer's Infrared Spectrometer, Lisse's team determined that the material in HD 113866 is more processed than the snowball-like stuff that makes up infant solar systems and comets, which are considered "cosmic refrigerators" because they contain pristine ingredients from the early solar system. But, the material is also not as processed as the stuff found in mature planets and asteroids. This means the dust belt must be in a transitional phase, when rocky planets are just beginning to form.

For the Spitzer Science Center, I'm Daniel Brennan.

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