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## Solar systems like ours may be rare

**A new study indicates that our setup may be quite unique indeed****By Clara Moskowitz**  
**SPACE**

updated 1:27 p.m. ET, Mon., July. 21, 2008

As humans look farther into the universe and discover more and more planets beyond the sun, many wonder how typical our own solar system is. Often astronomers in the planet-hunting business say discoveries of Earth-like worlds are just around the corner.

But a new study indicates our setup may be rare indeed.

A group of astronomers surveyed sun-like stars in the Orion nebula open cluster and found that fewer than 10 percent have enough surrounding dust to make Jupiter-sized planets.

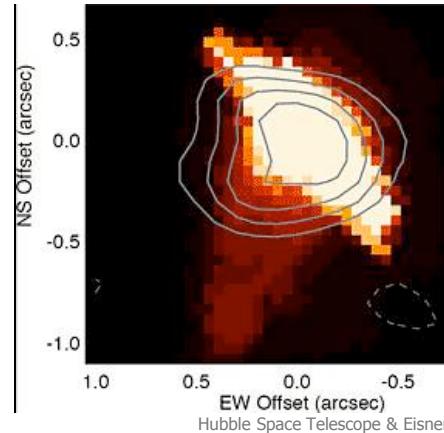
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"We think that most stars in the galaxy are formed in dense, Orion-like regions, so this implies that systems like ours may be the exception rather than the rule," said researcher Joshua Eisner, an astrophysicist at the University of California, Berkeley.

That's important because giant planets like Jupiter may be instrumental in fostering life on rocky worlds like Earth.

Eisner and his team observed about 250 stars in the million-year-old Orion Nebula, looking for dense disks of dust surrounding the stars that could be forming planets. They found that only about 10 percent of the stars emitted radiation in the frequency that would indicate they have these proto-planetary disks of warm dust. And only 8 percent of the stars surveyed had dust disks with masses greater than one-hundredth the mass of the sun, a mass thought



A Hubble Space Telescope image of visible light emitted by a protoplanetary disk in the Orion Nebula called proplyd 170-337 shows hot, ionized gas (red) surrounding and streaming off of a disk (yellow). The contours reveal the dust disk hiding within the hot gas.

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to be the lower limit for formation of Jupiter-sized planets.

These findings seem to agree with what planet hunters are finding so far when they use radial velocity studies to detect extrasolar planets around other stars. (The radial velocity approach involves looking for a wobble in a star's motion caused by the slight gravitational pull of an orbiting planet.)

"The current numbers are suggesting 6 to 10 percent of stars have Jupiter-sized planets, which is exactly consistent with our findings," Eisner told SPACE.com.

The researchers will detail their findings in the Aug. 10 issue of the Astrophysical Journal.

#### **Snapshot in time**

Still, it's too soon to completely despair of finding the universe filled with Jupiters around other suns.

Since the survey only looked at dust around the stars, and would not have detected any already-formed planets, it could be that some of those sun-like stars already had planets.

"Perhaps we're only detecting the stars that have not formed planets yet," said John M. Carpenter, an astronomer at Caltech who worked with Eisner on the Orion research. "Perhaps some other stars

already formed planets. It's only a snapshot in time and as you look at other clusters at different ages you can build up a better picture."

Other scientists agree there are many unanswered questions about solar systems beyond our own.

"As the precision with which we can measure improves, we find more planets," said Harvard planet hunter David Charbonneau, who was not involved in the Orion study. "The rate of occurrence has gone up since we started looking."

He said it's too soon to tell for sure whether Earth's system is atypical, but studies that look at whether other stars have the raw materials necessary to form solar systems like our own can help.

"Certainly knowing that there is enough stuff around stars to make planets is a crucial step," he said.

Rare life?

If it turns out to be true that sun-like stars with Jupiter-sized planets are rare, it may mean that extraterrestrial life is rare as well.

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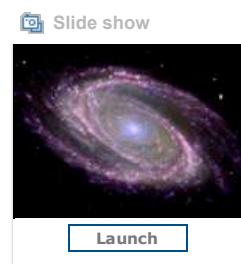
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Some scientists have suggested that having our own Jupiter has been instrumental in forming life on Earth. For one thing, large planets can protect smaller inner planets from being bombarded too heavily by space rocks, which could crush any budding bits of life.

Plus, large planets could kick comets and asteroids out of their orbits and onto paths toward the smaller terrestrial planets. These space rocks could be delivery systems for organic materials and water.

"If you don't have a Jupiter it's kind of hard to build a wet planet," Eisner said.

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