

# BABY PLANET PROBABLY BEING TORN APART BY OWN SUN

BY SARAH KAPLAN

Sometime in the past 2 million years, from the swirling gas and rubble surrounding a star in the constellation Orion, scientists believe a planet was born.

If this newborn world exists, it's a massive, boiling place — twice as big as Jupiter, cloaked in a cloud of gas and so close to its star that a year there lasts just 11 Earth hours. It's also incredibly rare: Before it was discovered in 2012, scientists didn't think that gas giants could exist around stars as young as its host.

But the planet, dubbed PTFO 8-8695 b, is already falling apart, says Rice University astronomer Christopher John-Krull. Like Icarus, it got too close to the sun. Now it's slowly being stripped of its mass by the inexorable pull of the star's gravity.

John-Krull released his findings, which will be published in the *Astrophysical Journal* later this year, on the academic paper sharing website arXiv last week. The find-

ings suggest that PTFO 8-8695 b really is a planet, even though "it kind of defies all of our obvious explanations" for how planets form, he said.

And they leave him and his team wanting to know more.

PTFO 8-8695 b was first identified several years ago, when another team of researchers began noticing regular dips in the brightness of the star it orbits. This suggested that a planet was crossing in front of the star, briefly blocking some of its light from Earth's view.

But the star was young — just about 2 million to 3 million years old — and young stars are often covered in sun spots that make them gutter and flare unpredictably. So there was some skepticism that a planet had really been found.

That's when John-Krull and his team decided to take a closer look. It was a relatively easy thing to do — at least, as far as stargazing goes — since PTFO 8-8695 b completes an orbit once every 11 hours. The astronomers could get an en-

tire year's worth of data in just a single night.

Using spectroscopic analysis, which divides light up into its component parts, they identified two separate sources of a type of light emitted by highly energized hydrogen atoms, called H alpha. One set of H alpha emissions was clearly coming from the star, since it carried signatures of the type of magnetic activity that happens on stars. But the other source seemed to move back and forth across the star — at exactly the pace you would ex-

pected before he can be certain. But there was also something odd about it.

"The H alpha emission is very strong, almost as strong as what's coming from the star, even though the planet is only 3 percent of the size of the star," John-Krull said.

There are a few explanations for this behavior, he said. It's possible that PTFO 8-

8695 b formed farther out in the solar system and somehow got knocked or pulled closer to its sun — which could explain how such a large planet exists so close to a star. That phenomenon has been observed elsewhere in the galaxy and seems to result in smaller, Neptune-sized planets that orbit in tight circles around their suns.

"We may be seeing that in action right now," John-Krull said. "But then the question is: Where does it stop? Does it eventually stop losing mass, or does it keep going until it falls into the star?"

He and his team will keep observing this star.

Kaplan writes for The Washington Post.

## LIGHTS DROWN OUT MILKY WAY FOR ONE-THIRD OF WORLD'S POPULATION

BY MARCIA DUNN

CAPE CANAVERAL, Fla.

More than one-third of the world's population can no longer see the Milky Way because of man-made lights.

Among those missing out on awe-inspiring Milky Way views: nearly 80 percent of North Americans and 60 percent of Europeans.

These are the findings of a new global atlas of light pollution, published as part of a scientific paper Friday.

More than four-fifths of Earthlings now live beneath skies polluted by artificial light, which blocks out the Milky Way for more than a third of them, according to the research.

"I hope that this atlas will finally open the eyes of people to light pollution," lead author Fabio Falchi said in a statement. He is with the Light Pollution Science and Technology Institute in northern Italy.

Tiny Singapore is the most light-polluted country; the entire population loses out on seeing the true night sky. Kuwait and Qatar are close runners-up. On the opposite end of the spectrum — countries whose populations are exposed to the least light pollution — are Chad, Central African Republic and Madagascar.

Falchi and his team members warn the problem affects more than astronomers. It's profoundly altered a fundamental human experience, namely that of pondering the night sky.

Co-author Christopher Elvidge, a scientist with the National Oceanic and Atmospheric Administration's National Centers for Environmental Information in Boulder, Colorado, bemoans the fact that "whole generations" of Americans have never seen the Milky Way.

"It's a big part of our con-

nection to the cosmos — and it's been lost," he said in a statement.

The situation is even worse for some animals. Artificial light can confuse insects, birds and sea turtles, with deadly results. There's also the waste of energy and money, the researchers point out.

The National Park Service's Dan Duriscoe, a co-author, noted that some national parks in the West like Yellowstone are among the last refuges of darkness in the U.S. Urban light a few hundred miles away or more can spoil nighttime vistas, even in pristine federal land like Death Valley National Park in Southern California.

The report — which appears in the journal *Science Advances* — is based on new satellite data and special software.

Dunn writes for The Associated Press.

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