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# Amateur finds new nebula with small telescope

By Robert Roy Britt

[SPACE.com](#)

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**(SPACE.com) -- In an era of huge ground-based telescopes, clever robotic sky scanners and powerful observatories in orbit, there are few deep space objects in our galaxy that escape notice by professional astronomers.**

So no one was more surprised about the discovery of a new nebula than the amateur who stumbled upon it with his small backyard telescope.

"I was absolutely shocked," Jay McNeil said a few days after his remarkable finding was announced by the International Astronomical Union (IAU) earlier this month.

While comets and asteroids are occasionally discovered by backyard skywatchers, astronomers can't remember the last time an amateur found something this unique. By many accounts it has been several decades.

### And a mystery, too

McNeil's nebula, as it is being called, is an illuminated cloud of gas and dust. It is lit by what astronomers think is a newborn star, catalogued as IRAS 05436-0007. Little is known about the star.

Since the announcement, the discovery has generated a mystery.

McNeil's Nebula was not visible in seven



An image from Kitt Peak National Observatory shows Jay McNeil's Nebula in true colors.

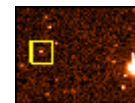
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photographs made between 1951 and 1991 for the Digital Sky Survey. But it did show up in a 1966 photo taken by Evered Kreimer, according to the web site of a space education organization called Students for the Exploration and Development of Space (SEDS), based at the Massachusetts Institute of Technology. Several SEDS readers informed the organization of the Kreimer image, which SEDS members confirmed.

The nebulous object in the 1966 image had never been cataloged, however.

Nebulas are cloudy regions of space that sometimes reflect light, or they can be visible by the light they block, creating dark "holes" in space. Other nebulous areas shine because the gas in them is heated to the point that it glows.

McNeil's nebula is the reflective type. It is near a broader nebulosity complex called M78 in the constellation Orion.

### Little telescope

Jay McNeil says he does astronomical imaging every clear night from his backyard observatory in western Kentucky.

"I have been an ardent visual observer for nearly 20 years and imaging for merely two years, however," he said. "This is my very first discovery."

On January 23, McNeil was testing a "little scope," a 3-inch (76-mm) model he'd recently bought. He made nearly two hours worth of exposures of M78 and its surroundings.

McNeil's day job intervened, and nearly a week went by before he had time to process the images and study the results. He was not expecting anything unusual.

"I almost immediately noticed a peculiar, almost funky-looking tiny, elongated object," he explained in a letter to fellow observers. "Having observed this area of Orion on many occasions, both visually and on others' photographs, I soon realized that I had never before noted such an object in this area of the sky."

### Behind the outburst

McNeil sent his observations to Brian Skiff at the Lowell Observatory in Flagstaff, who also recognized it as something new. Skiff suggested McNeil forward the imagery to Bo Reipurth at the University of Hawaii, an expert on early stellar evolution.

Reipurth figures the star is a relative newborn, deeply embedded in its own natal cloud. It has apparently undergone an outburst that accounts for its sudden brightness and the illumination of the surrounding cloud -- the nebula.

Reipurth called the outburst a very rare event.

The finding was announced February 9 by the IAU.

Astronomers say the need is urgent to follow the progress of the current outburst with further imaging. Reipurth said the star might fade over months or years, with outbursts like the present one occurring now and then.

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The flare-up McNeil detected probably has something to do with material swirling around the star in a fairly flat, unseen "circumstellar disk," the leftover gas and dust of star formation from which -- in the right conditions -- planets are thought to form. Rocky planets like Earth develop over millions of years, however, as dust sticks together to make rocks, some of which collide and gather to become larger rocks.

IRAS 05436-0007 hasn't been around that long. When a star is young -- and prior to any planets forming -- gas and dust from the disk can accrete, or fall onto the star, generating outbursts.

"I guess that a major accretion event is taking place," Reipurth said. "Eventually such a disk is likely to form planets, but this is still much too early in the evolution. The present disk will contain only dust grains besides all the gas."

Large observatories have already started looking at the scene, and additional explanations for this strange "new" nebula are expected next month.

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