

Peter Pan Disks: Long-lived Planet-Forming Disks Discovered by Citizen Scientists

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What is the science question?

Our Team was originally trying to investigate how long it takes for gas giant planets like Jupiter to form.

What were your findings?

- Planets form in disks — clouds of dust and gas that orbit young stars and tend to disappear in a few million years. We discovered a new class of disks that retains the gas needed to form planets like Jupiter much longer than other disks.
- These disks, which orbit nearby low-mass stars, are called “Peter Pan Disks” because they won’t grow up.

What was the impact?

We learned that planets like Jupiter may have up to about 10 times as much time to form around certain stars as previously thought.

Why does it matter to non-scientists?

- Peter Pan disks were discovered by volunteers! Roughly thirty-thousand citizen scientists have contributed to the Disk Detective citizen science project. Eight of them are co-authors on this new paper.
- Long-lived disks like this may result in planets with more circular orbits, like those in the solar system.

Peter Pan Disk. Artwork by citizen scientist Jonathan Holden.

Steven Silverberg, John Wisniewski, Marc Kuchner (667), et al. 2020, “Peter Pan Disks: Long-lived Accretion Disks Around Young M Stars,” *Astrophysical Journal*

