

## **Astrobiology News April 2019: Is “Raising” Planets a Community Effort?**

There are many words we apply to biological life that work well as metaphors to describe aspects of the physical Universe. For example, we speak of star “birth” and “death”, and “nature vs. nurture” when discussing processes that are important in the formation of clusters of stars. It seems the old proverb, “It takes a village to raise a child,” might also provide an apt analogy for how crowded young star clusters can influence the development of infant planetary systems.

Mature stars like our Sun are separated by such enormous distances that encounters with other stars are extremely rare, but the situation can be quite different for very young stars. Over the past few decades we’ve learned that most stars form in clusters with many “siblings”. While there are estimated to be a few hundred stars within 10 parsecs (32.6 light-years) of the Sun<sup>1</sup>, there are thousands of stars within a similar volume in the Orion Nebula Cluster, an environment that we have compelling reasons to think is similar to the environment of our Solar System in its infancy<sup>2</sup>.

UC Berkeley and Stanford University astronomers recently published compelling evidence that a close flyby about 3 million years ago by a pair of stars (a binary star system) to a young planet, orbiting a binary known as HD 106906, stabilized the planet’s orbit and prevented it from being “booted out” of its system by its “parent” stars<sup>3</sup>. The astronomers used the Gemini Telescope in Chile and the Hubble Space Telescope to image the young planetary system, and data from the remarkable Gaia space observatory<sup>4</sup>, which has collected precise measurements of distance, position, and motion for 1.3 billion stars in our Milky Way Galaxy, to pinpoint the binary system that had a close encounter with HD 106906<sup>5</sup>.

Peculiarities in the orbits of worlds in the outer regions of our Solar System, including the hypothetical Planet Nine, might also be linked to the close approach of another star during the Solar System’s infancy. In any event, the more we learn about stars and planets in their formative years, the clearer it becomes that interactions with neighbors can play an important role in their development!

Until next month,

Grace (gwolfchase@adlerplanetarium.org)

---

<sup>1</sup> <http://www.recons.org/census.posted.htm>

<sup>2</sup> Hester, J.J. et al. 2004, "The Cradle of the Solar System," *Science*, 304, 1116.

<sup>3</sup> De Rosa, R.J. and Kalas, P. 2019, "A Near-coplanar Stellar Flyby of the Planet Host Star HD 106906," *AJ*, 157, 125.

<sup>4</sup> <http://sci.esa.int/gaia/>

<sup>5</sup> <https://news.berkeley.edu/2019/02/28/exiled-planet-linked-to-stellar-flyby-3-million-years-ago/>