

Astrobiology News November 2020: The Continuing Search for Earth-like Planets

In April 2018, I wrote about the launch of NASA's *Transiting Exoplanet Survey Satellite (TESS)* for the Clergy Letter Project.¹ In December 2018, *Zooniverse*² launched *Planet Hunters TESS*³, a citizen-science project that asks volunteers of all ages and from all walks of life around the world to help identify exoplanets orbiting "nearby" stars using data from the *TESS* mission. Citizen-science volunteers search for telltale dips in time series of brightness measurements (known as "light curves") as an exoplanet passes in front of its star. A research paper describing the properties of the first exoplanet discovered by citizen scientists working on *Planet Hunters TESS* was published earlier this year⁴. The Saturn-sized exoplanet (TOI813 b) orbits an aged star (TOI813) with a period of 84 days. As stars mature, they expand; TOI813 is on its way to becoming a "red giant," and is predicted to engulf TOI813 b in less than one billion years. Several citizen scientists are co-authors with the researchers on this publication.

Along with discovering 74 exoplanets and 1,200 exoplanet candidates, *TESS* produced images of about 75% of the sky during its primary two-year mission. Now in its extended mission, *TESS* will reobserve exoplanets discovered earlier, find new ones, and fill in coverage gaps from its initial survey⁵. This month, *Planet Hunters TESS* added 20,000 new light curves for citizen scientists to inspect. Any one of these light curves might reveal previously unknown planets, and any one of you reading this could be the first to identify a truly Earth-like planet by participating in this project! So far, about 25,000 citizen scientists have sifted through 15% of the new data, so there's plenty left to do.

As I've asked before, if you use the *Zooniverse* platform, either individually, as a family, or as part of a group or class project, would you mind taking just a few minutes to fill out a [pre-participation](#)⁶ and/or [post-participation](#)⁷ survey if you haven't done so already? These will help us evaluate and improve the *Zooniverse* experience for everyone! If you'd like to learn more about *Zooniverse*, you can check out my September 2020 webinar to the *Institute on Religion in an Age of Science*, which is available on YouTube⁸.

¹ <http://www.theclergyletterproject.org/pdf/abnews42018.pdf>

² <https://www.zooniverse.org/>

³ <https://www.planethunters.org>

⁴ DOI:10.1093/mnras/staa138

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<https://www.nasa.gov/image-feature/goddard/2020/nasa-s-tes-creates-a-cosmic-vista-of-the-northern-sky>

⁶ Pre-survey: <https://forms.gle/x5TezWJEqAZnLb39A>

⁷ Post-survey: <https://forms.gle/opYzTKSxK3PFJtv9A>

⁸ <https://www.youtube.com/watch?v=PoeJ9d5ShVY&feature=youtu.be>

Finally, I'm also excited to tell you about a just-released volume in the *Routledge Science and Religion Series*. *Intersections of Religion and Astronomy*⁹, edited by Aaron Ricker, Chris Corbally (of the Vatican Observatory), and Darry Dinnell, presents a comprehensive exploration of how our views of the cosmos and religion interrelate and matter for real people. This volume includes chapters written by an interdisciplinary team of international scholars. I wrote the chapter, "Astrobiology, Astroethics, and Astrotheology in Conversation," which examines how the search for Earth-like exoplanets and extraterrestrial life has provided rich content for dialog among scientists, theologians, and ethicists.

Until next month,

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