

## **Supporting Students and Researchers in a Virtual Exoplanet Research Workshop**

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Research contributions of ordinary citizens can significantly help the progress of science. In NASA's Exoplanet Watch, for example, citizens observe transits of exoplanets using small telescopes and analyze them afterward, saving time for more powerful telescopes to observe less accessible phenomena. Participating in research also helps budding scientists and other non-experts develop their abilities in scientific inquiry within professional-amateur communities. However, though these accessible research experiences can help both researchers and non-scientists alike, most classrooms do not incorporate this model of learning.

We designed a virtual exoplanet research workshop modeled off the astronomy research seminar course taught at a variety of high schools and colleges, where students conduct a research project over the course of a semester and publish in a journal. With a collection of transit images that would be time-consuming to process on an individual machine, we reasoned that other students would be able to help us process transit images at a larger scale while developing their own skills in astronomy research. The workshop makes use of the Exoplanet Transit Interpretation Code (EXOTIC) program for data reduction. Materials are shared using Google Drive, and participants contribute data analysis using Google Colaboratory notebooks.

So far, over 200 students have contributed observations of the exoplanet Qatar-1 b to Exoplanet Watch through the workshop. Two teams have submitted their papers to the Journal of the American Association of Variable Star Observers, and more teams have papers currently in progress. We are continuing to publish online resources for learning about exoplanet research and relevant tools and techniques, providing an entry point into practical astronomy research for students worldwide.