Contributed Talk

Splinter Exoplanets

An Earth-sized planet transiting an M-dwarf in a 4.3-hour orbit

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We report the discovery from $K2$ of a transiting terrestrial planet in an ultra-short-period orbit around an M3-dwarf. The planet completes each orbit in just 4.3 hours, the second-shortest orbital period of any known planet, only 4 minutes longer than that of KOI 1843.03, which also orbits an M-dwarf. Using a combination of imaging, RV measurements, and light curve modelling, we show that no plausible eclipsing binary scenario can explain the $K2$ light curve, and thus confirm the planetary nature of the system. The short-period orbit of the planet, whose radius we determine to be 0.89 ± 0.09 $R_\oplus$, allows us to place constraints on its composition - we find it must be composed of at least 45 % iron. We also discuss the possible implications of the surprising fact that the two shortest-period planets known both orbit M-dwarfs.