

# GJ 367b: A dense, ultrashort-period sub- Earth planet transiting a nearby red dwarf star

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Ultrashort-period (USP) exoplanets have orbital periods shorter than 1 day. Precise masses and radii of USP exoplanets could provide constraints on their unknown formation and evolution processes. We present the work from Lam et al. 2021 (*Science*, 374, 1271) and report the detection and characterization of the USP planet GJ 367b using high-precision photometry and radial velocity observations. GJ 367b orbits a bright (*V*-band magnitude of 10.2), nearby, and red (M-type) dwarf star every 7.7 hours. GJ 367b has a radius of  $0.718 \pm 0.054$  Earth-radii and a mass of  $0.546 \pm 0.078$  Earth-masses, making it a sub-Earth planet. The corresponding bulk density is  $8.106 \pm 2.165$  grams per cubic centimeter — close to that of iron. An interior structure model predicts that the planet has an iron core radius fraction of  $86 \pm 5\%$ , similar to that of Mercury's interior.