

P327a *Spitzer* and *CHEOPS* follow-up of the nearby multi-planet system GJ 9827

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At a distance of 30 pc, the three super-Earths orbiting GJ 9827 are some of the most promising targets for follow-up studies of small planets in a near-resonant chain. In particular, with radii spanning the “radius valley”, measuring the densities of these planets provides unique constraints on their co-evolution via possible convergent inward migration and subsequent photoevaporation. Previously, ground-based radial velocity (RV) measurements have yielded dynamical constraints on the planet masses, and hence also their densities, but the outer two planets remain poorly characterized. We present new *Spitzer* and *CHEOPS* transit observations of all three planets in the system, with which we refine the orbital ephemerides and radii. These observations enhance existing estimates of the planet densities and help to ensure the feasibility of future atmospheric characterization with *JWST*. Furthermore, we study the dynamical interactions between the planets via transit timing variations (TTVs), yielding independent dynamical mass measurements of the planets in the system that further improve our understanding of their density and composition. We also present evidence of a fourth planet that has so far eluded detection, but may have played an important role in the formation and evolution of the system.