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Chaos in Kepler's Multiple Planet Systems and K2's Observations of the Atmospheres of Uranus & Neptune

More than one-third of the 4700 planet candidates found by NASA's Kepler spacecraft during its prime mission are associated with target stars that have more than one planet candidate, and such "multis" account for the vast majority of candidates that have been verified as true planets.The large number of multis tells us that flat multiplanet systems like our Solar System are common. Virtually all of the candidate planetary systems are stable, as tested by numerical integrations that assume a physically motivated mass-radius relationship, but some of the systems lie in chaotic regions close to instability.

The characteristics of some of the most interesting confirmed Kepler multi-planet systems will be discussed.

The Kepler spacecraft's 'second life' in theK2 mission has allowed it to obtain long time-series observations of Solar System targets, including the giant planets Uranus & Neptune.These observations show variability caused by the chaotic weather patterns on Uranus & Neptune.