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Two Exoplanets Confirmed With Combined Data From Several Missions

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The newest addition to our planet-hunting arsenal, the HARPS spectrograph, has characterized two new worlds. Planets KOI-200 b and KOI-889 b are Jupiter-like planets that orbit very close to their host stars.

With periods of less than 10 days, the so-called "Hot Jupiters" were originally detected using NASA's Kepler spacecraft. This instrument has documented more than 800 new exoplanets, with thousands more potential candidate worlds.

While these numbers are exciting, the Kepler observations need to be followed up by more sensitive instruments that can characterize the planet's mass and orbital parameters. The ground-based SOPHIE instrument was used to detect the tiny changes in the host star's movement due to the gravity of the planet(s) orbiting around.

From these measurements rough estimates of the planets masses could be calculated. But more sophisticated observations were needed to refine the mass limits and to ascertain the orbital periods.

According to Alexandre Santerne, one of the scientists on the team that completed this study, "The SOPHIE spectrograph was already playing an important role in the characterization of Kepler planets by unveiling the true nature of the candidates and measuring the mass of giant planets. With the new HARPS-N spectrograph, with an even better accuracy, we expect to characterize much smaller exoplanets, hopefully down to the size of the Earth."

Using the northern twin of the HARPS spectrographs – HARPS-N – researchers were able to determine that KIO-200 b has mass slightly below that of Jupiter, but is also slightly larger in diameter. It has a highly eccentric orbit, and completes its journey around its parent star in less than 7 days.

The larger KOI-889 b is classified as a super-Jupiter. At more than 10 times the mass of the king-of-the-planets, this gas giant also follows an orbit that is considerably more elliptical than any in our solar system, while completing a single loop around its star in a mere 9 days.

Santerne added, "Even if they are just hot and giant planets, as we already know hundreds of them, these two planets are orbiting on highly eccentric orbits, which is relatively rare for such short-period planets. I prefer to see these two new planets as two other bricks in the wall of our knowledge about planetary systems: bigger is the wall, better we understand planetary formation and evolution."

The article KOI-200 b and KOI-889 b: two transiting exoplanets detected and characterized with Kepler, SOPHIE and HARPS-N was accepted for publication in *Astronomy & Astrophysics* journal.