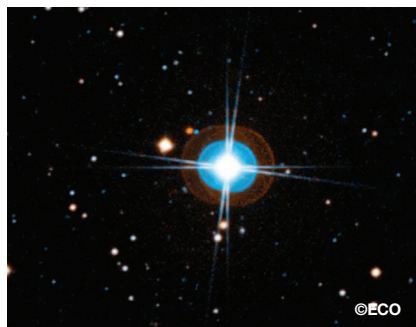

system of seven planets discovered

alexandre correia

department of physics & I3N, university of aveiro

lovis, segransan, mayor, udry, pepe, queoz, universit  de gen ve, switzerland · benz, universitat bern, switzerland · bertaux, universit  Versailles saint-quentin, france · bouchy, universit  pierre & marie curie, france · laskar, observatoire de paris, france · curto, european southern observatory, germany · mordasini, max-planck-institut fur astronomie, germany · santos, universidade do porto



An international team of astronomers, including Alexandre Correia from the Physics Department, University of Aveiro, have discovered a planetary system containing at least five planets, orbiting the Sun-like star HD 10180. The researching team also found strong evidence for two more planets, one of which would have the lowest mass ever found. This would make the system very similar to our Solar System in terms of the number of planets, which comprises eight planets.

The discovery has been made possible using the HARPS spectrograph, attached to ESO's 3.6-metre telescope at La



Silla, Chile. HARPS is an instrument with unrivalled measurement stability and great precision. It is the world's most successful tool to find planets around other stars. The method consists in measuring the Doppler shift of the star, and hence infers its radial velocity variations provoked by the complex gravitational attractions from the planetary companions.

The Sun-like star HD 10180 is located 127 light-years away in the southern constellation of Hydrus (the Male Water Snake), and it has been followed for six years. Thanks to 190 individual HARPS measurements, the astronomers detected five strong signals corresponding to planets

with Neptune-like masses, between 13 and 25 Earth masses, which orbit the star with periods ranging from about 6 to 600 days. The trace of two additional planets is also visible in the data. One would be a Saturn-like planet (with a minimum mass of 65 Earth masses) orbiting in 2200 days. The other would be the least massive exoplanet ever discovered, with a mass of about 1.4 times that of the Earth. It is very

close to its host star, with an orbital period of only 1.18 days.

The five Neptune-like planets are located between 0.06 and 1.4 times the Earth–Sun distance from their central star, that is, lying within a distance equivalent to the orbit of Mars. Thus, the HD 10180 system is more populated than our Solar System in its inner region, and has many

more massive planets there. In addition, all the planets seem to have almost circular orbits, and obey an equivalent of the Titius–Bode law that exists in our Solar System: the distances of the planets from their star seem to follow a regular pattern. The system of planets around HD 10180 is thus unique and the most similar to our own discovered so far.
