

Exoplanets around Evolved Stars

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Planets around evolved stars such as giants and subgiants have been intensively searched for the last 15 years, aiming to explore planets around more massive stars than the Sun and to investigate the orbital evolution of planetary systems during the post-main-sequence phase. Precise radial-velocity surveys have discovered more than 100 substellar companions around such evolved stars so far, and they exhibit statistical properties that are not necessarily similar to those around solar-type stars. Recently, very-high-precision spaced-based photometry by the Kepler space telescope has succeeded in detecting planetary transits on evolved stars. The discoveries include short-period planets and sub-Jupiter-mass ones around giants, which had rarely been found by the ground-based radial-velocity surveys.

Okayama Planet Search Program is one of the long-lasting planet search programs in the world targeting evolved stars. We have been monitoring radial-velocity variations of about 300 GK-type giants since 2001 using 188cm telescope and High Dispersion Echelle Spectrograph (HIDES) at Okayama Astrophysical Observatory. We have discovered about 30 substellar companions from the program so far, including the first planet around G-type giants, the first planet in an open cluster, multi-planet systems, and so on. Here we summarize the latest results from planet-search programs targeting evolved stars, and discuss future prospects.