

## CARMENES. II. Science case and M-dwarf sample

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### Abstract

CARMENES (Calar Alto high-Resolution search for M-dwarfs with Exoearths with Near-infrared and optical Echelle Spectrograph) is an instrument to be built for the 3.5m telescope of the Calar Alto Observatory. Its main goal will be to discover Earth-like planets in the habitable zone of late-type stars. It will consist of two separate spectrographs ( $R \sim 82000$ ) covering the optical and the near-infrared spectral bands. The optical bands will be used to monitor the stellar activity of the targets, while the infrared bands will be used to measure the radial velocity with a precision of  $1 \text{ m s}^{-1}$ . About 300 late-type M dwarfs will be monitored during 5 years; therefore, in order to increase the probability of discovering exoplanets, and exhaustive study of the targets is being performed. More than 2000 low-mass stars from different catalogs have been already compiled and their fundamental properties are being determined. In particular, spectral types and activity levels are very important for radial velocity surveys because activity is a source of radial velocity jitter that can hamper the detection of exoplanets. We are conducting low- and high-resolution spectroscopic observations of poorly-known targets in order to derive the spectral type as well as to estimate the chromospheric activity through the analysis of activity indicators such as the  $H\alpha$  emission line. Our goal is to be able to select only those targets that can potentially host habitable planets and that can be detected with CARMENES. Besides, this list will provide a large catalog of M-dwarf stars with well-known properties. In this poster, we briefly summarize the science case of CARMENES and the current status of the input list.