A new population of giant planets around M dwarfs with Gaia

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M-type stars, the most common in the universe, are a major focus for surveys because they are well-suited for detecting low-mass planets in the habitable zone. Despite their importance in the formation and evolution of low-mass planets, little is known about giant planets (GPs) in M star systems. Detecting long period GPs (with semi-major axis typically greater than 1 au) is difficult with transit methods and challenging with radial velocities (RV) due to the faintness and relatively high activity level of M stars. This significant limitation can be effectively addressed by combining RV and high-contrast imaging (HCI) with Gaia-Hipparcos absolute astrometry.

In this context, I used the GaiaPMEX tool presented in Kiefer et al. (2024) to detect GPs around all M stars closer than 15 pc with Gaia Data Release 3 data. GaiaPMEX uses astrometric data from Gaia and Hipparcos data when available to build a two-dimension confidence map to constrain the mass and the semi-major axis of the companion. When combining these maps with RV and HCI detection limits, we can rule out binary companions, as well as identifying and characterizing planetary companions. I built a catalog of M dwarfs within 15 pc and using GaiaPMEX, I performed a systematic search for GPs to produce a list of hundreds of planetary candidates. I will present the results of this survey which allows the study of a new population of long period GPs and in particular, to derive the radial distribution of GPs around M dwarfs beyond 1au.

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