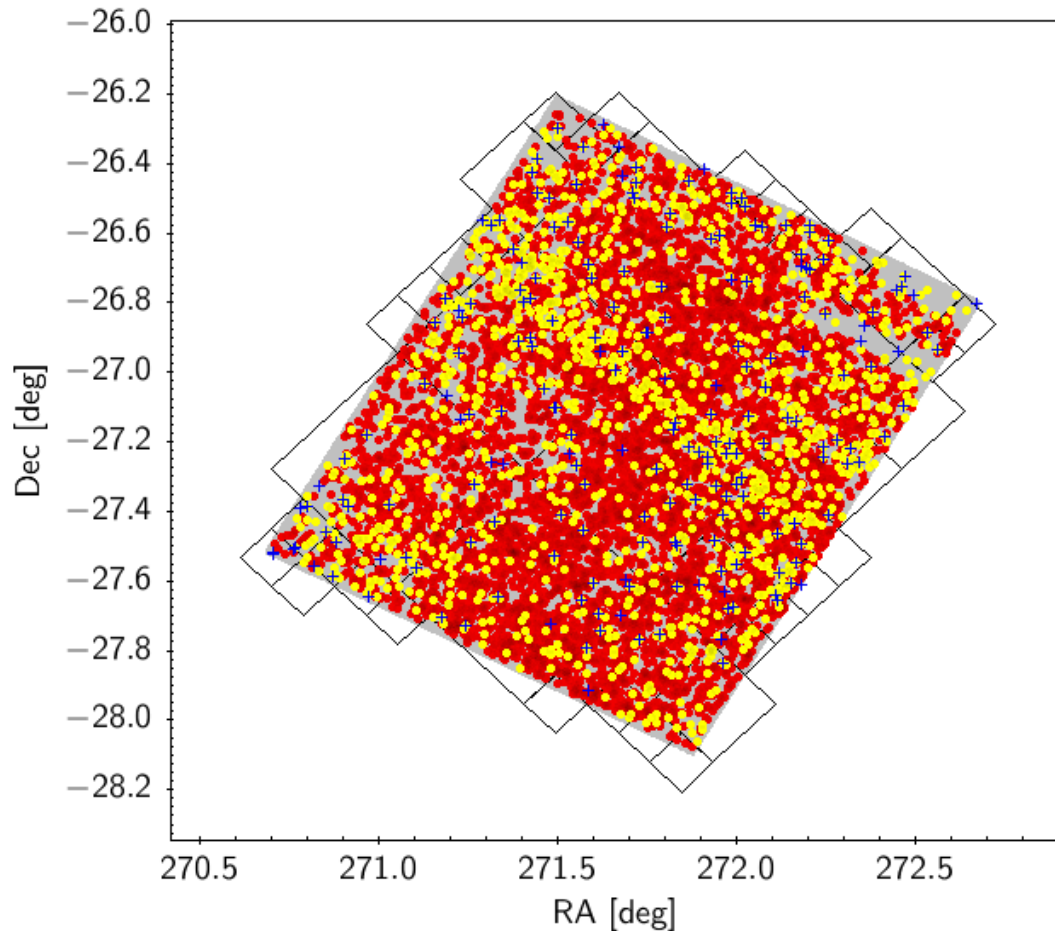


M-dwarf stars in the b294 field from the VISTA Variables in the Vía Láctea (VVV)



Sky position of the 7 925 characterised M dwarfs (red and yellow filled circles). Blue crosses show the 208 M dwarfs identified in Gaia DR3.

M-dwarf stars are the dominant stellar population in the Milky Way and they are important for a wide variety of astrophysical topics. The Gaia mission has delivered a superb collection of data, nevertheless, ground-based photometric surveys are still needed to study faint objects. Therefore, the present work aims to **identify and characterise M-dwarf stars in the direction of the Galactic bulge using photometric data and with the help of Virtual Observatory tools.**

Using parallax measurements and proper motions from Gaia Data Release 3, in addition to different colour-cuts based on VISTA filters, we identify and characterise 7 925 M-dwarf stars in the b294 field from the Vista Variables in the Vía Láctea (VVV) survey. We performed a spectral energy distribution fitting to obtain the effective temperature for all objects using photometric information available at Virtual Observatory archives. **The objects in our sample have temperatures varying from 2800 to 3900 K.** We also search for periodic signals in VVV light curves with up to 300 epochs, approximately. As a secondary outcome, we obtain periods for 82 M dwarfs by applying two methods: the Lomb-Scargle and Phase Dispersion Minimisation methods, independently. These objects, with periods ranging from 0.14 to 34 d, are good candidates for future ground-based follow up.

Our sample increased significantly the number of known M dwarfs in the direction of the Galactic bulge and within 500 pc, showing the importance of ground-based photometric surveys in the near-infrared.