The giga-CMD of the VVV survey

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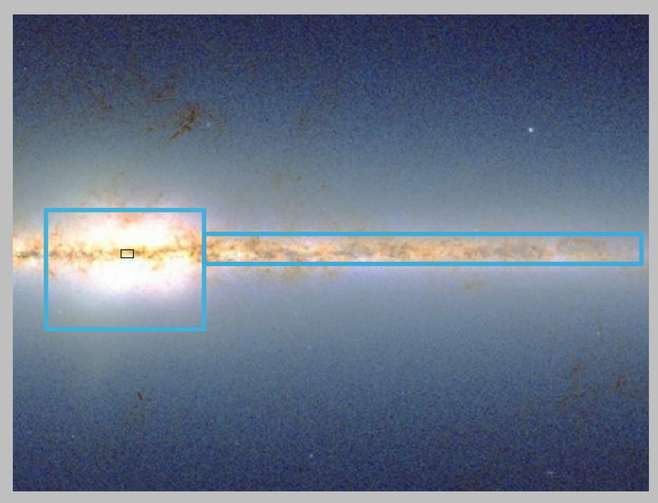
Abstract. **The Vista Variables in the Vía Láctea (VVV) survey has changed our picture of the inner Galaxy in the last years. The inner regions of our Galaxy are hidden behind curtains of gas and dust, and their observations at visible wavelengths are severely hampered by this fact. Observations in the near-infrared are better suited due to the diminished effect of extinction at these wavelengths. VVV, one of the six ESO public surveys conducted with the 4m VISTA telescope in Paranal, has observed 562 square degrees of the Galactic bulge and an adjacent region of the southern disk in the Z, Y, J, H, and Ks near-infrared filters during the last 6 years. Using PSF photometry on the VVV images, we have produced a deep and highly complete color-magnitude diagram (CMD) with nearly one billion sources that gives us an unprecedented view of the Galactic bulge and inner disc. In this poster, we present CMDs of some interesting sections of the VVV field, and provide a qualitative description of the stellar populations residing in it. We also mention the possibilities it provides to better understand the reddening law towards the inner Galaxy and to provide high-definition extinction maps.**

The VVV survey



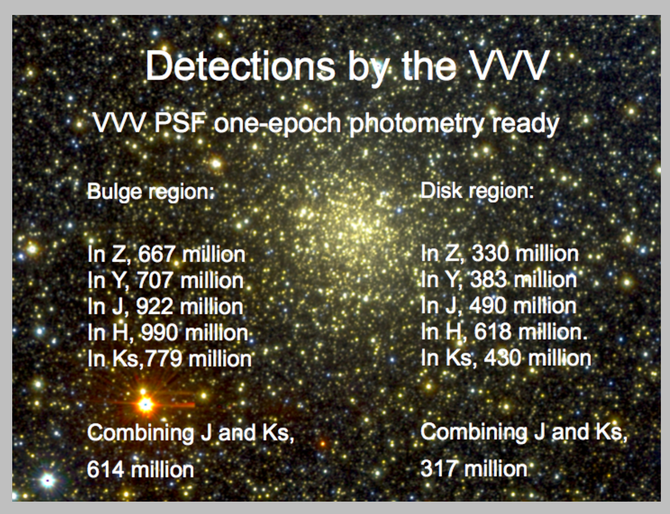
4m VISTA telescope in Cerro Paranal (Chile).

VIRCAM camera
- 16 detectors
- Resolution: 0”.34 per pixel.
- Total FOV: 1.48 x 1.11 deg^2
- 5 near-infrared filters: Z, Y, J, H, and K_s.

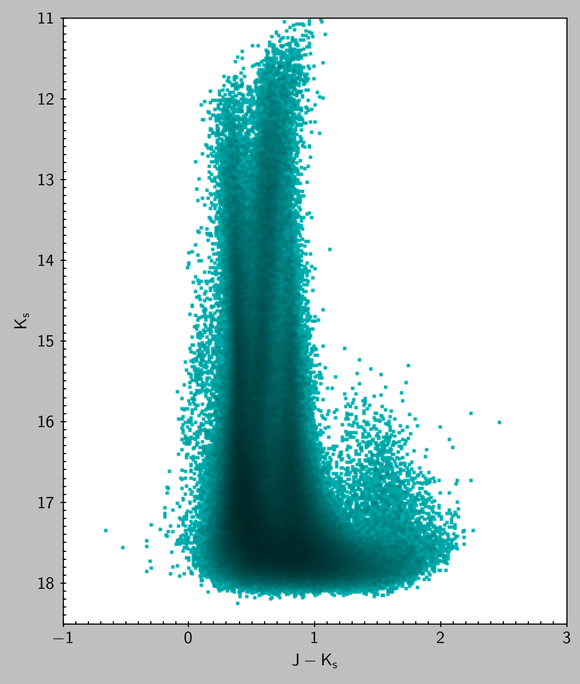
562 deg^2 surveyed in the inner Milky Way.
- Galactic bulge:
  -10.0º < l < +10.5º, -10.3º < b < +5.1º
- Adjacent Galactic disc:
  -65.3º < l < -10.0º, -2.25º < b < +2.25º

Variability campaign in K_s with ~100 epochs at the end of the survey.

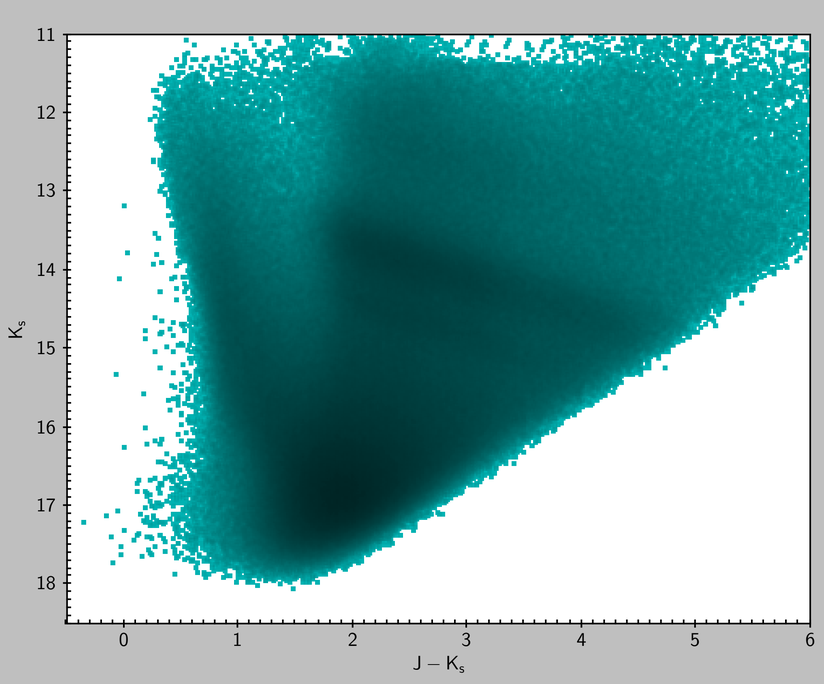
More information on the VVV:
https://vvvsurvey.org/



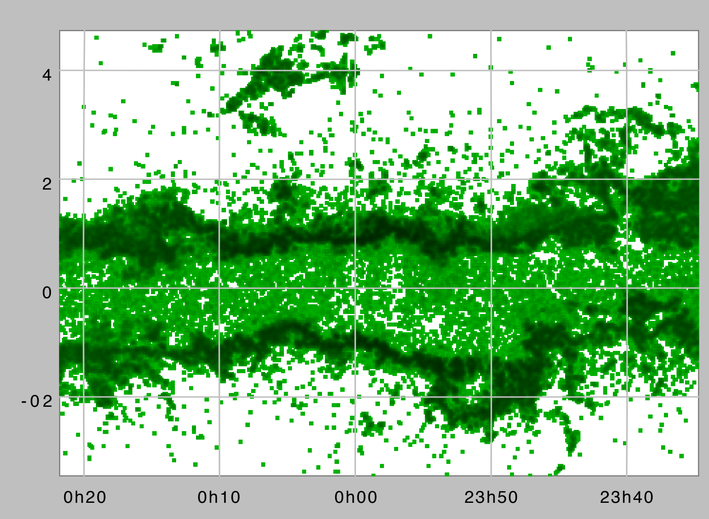
CMDs and extinction in the inner Galaxy

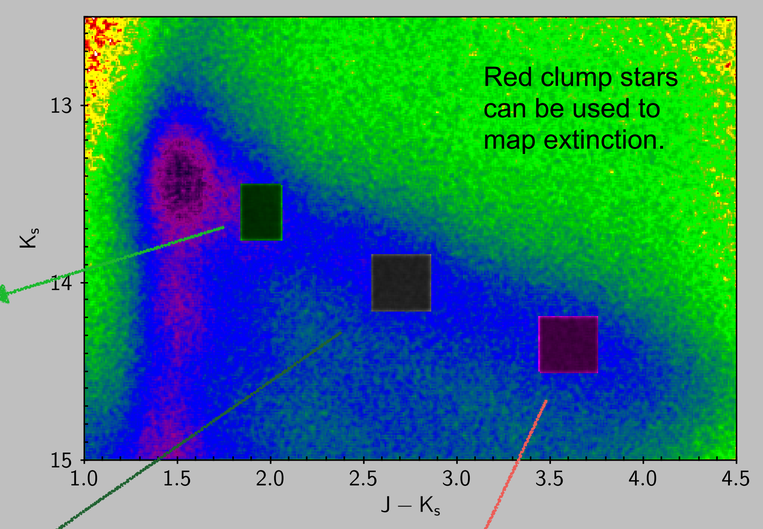


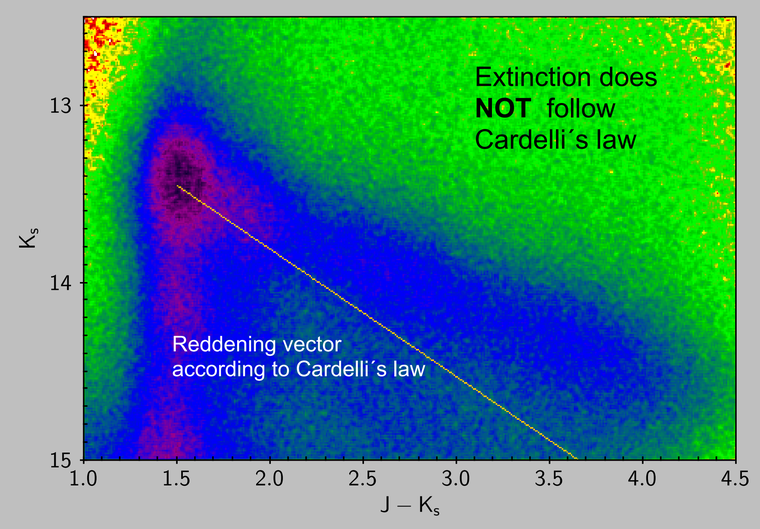
The effects of the different blobs of extinction at low latitudes are clearly observable in the VVV fields. On the left we can observe the color magnitude diagram of one of the outer VVV fields, where extinction is not so important. Our improved photometry allows for higher contrast in the sequences observed in the CMD. Following Saito et al. (2012), we can distinguish and separate the different evolutionary sequences corresponding to the main sequence of the disk population (blue sequence), red giant sequence of the bulge population (middle sequence), late dwarf from the thin disk (red sequence) and outer unresolved galaxies (dimmer extremely red sequence). On the right the different evolutionary sequences are blurred out in the CMD of one of the inner VVV fields.

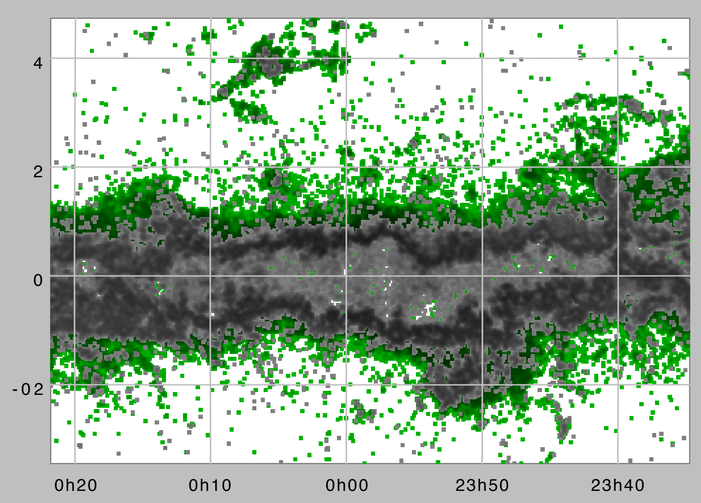


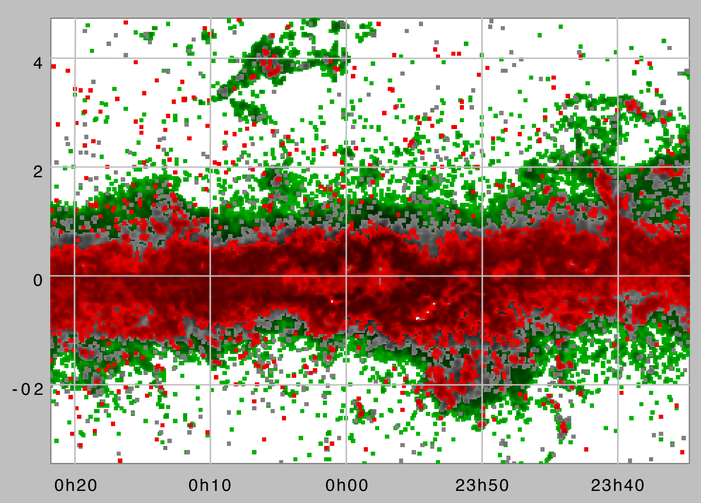
Stars from the red clump of the metal-rich population of the bulge can be used to map the extinction along the VVV fields (Gonzalez et al. 2012). The new deeper and more complete CMDs will allow us to produce reddening maps with higher resolution. We can also explore with the red clump stars the extinction law towards these low-latitudes lines of sight, which is found to be non-canonical.











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References

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