# Mapping the Milky Way with incomplete data

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Modern wide-field photometric and spectroscopic surveys provide us with unprecedented amounts of data covering all components of the Milky Way. Their respective catalogues are however often limited in footprint (especially ground-based spectroscopic surveys) and always limited in (at least) magnitude, which translates into complex volume limits. In this talk I will show how to construct the selection function corresponding to any subset of the Gaia data using the tools developed by the GaiaUnlimited project. I will present recent results obtained from the combination of Gaia and APOGEE concerning the radial and density profile of the Milky Way. I will also discuss the challenge of mapping the large-scale structure of our Galaxy through its star clusters, and the completeness of the cluster census.