A Map of Our Galaxy & Extragalactic Neighbourhood

Locations of Stars, and the Dwarf Satellites of Milk Way & Andromeda Galaxy in a Galactic Coordinate Map

Generate a Hammer-Aitoff map showing the distribution of bright stars (mostly O, and B) from the catalogue of Reed et al. (2003, 2005). The map should be in Galactic coordinates with Galactic longitude of 0 degree occupying the centre of the map.

The stellar data file is attached separately. You may use available standard routines to generate an Aitoff grid.

The location of the stars should be indicated by reasonably big, filled circles. Avoid making the data points too small to the point where it becomes difficult to see.

Plot in the same map the locations of the Large Magellanic Cloud, Small Magellanic Cloud, Andromeda Galaxy using slightly bigger filled ellipses of a different colour. You can get the coordinates of LMC and SMC, and Andromeda from NED (NASA Extragalactic Database) : https://ned.ipac.caltech.edu/

Also plot in that map the locations of all the other dwarf satellite galaxies identified as part of the Local Group of galaxies. The Milky Way and Andromeda are the two most massive, most luminous members of the Local Group.

The coordinates of the Local Group galaxies can be found in McConnachie, A.W., 2012, AJ, 144, 4, and on Alan McConnachie's page:

https://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/en/community/nearby/

The Local Group dwarf galaxies should be plotted using filled ellipses of a different colour. All external galaxies should be labelled in the plot.

The plot should have a caption that explains what the plot is, and the symbols represent.

Plotting all this data in one map, might make it a bit cluttered, but that is OK. Try to make the plot as aesthetically pleasing as possible. Generating the plot in landscape mode would help.

In a single PDF file, submit the (a) code (b) the map.

Additional Challenge: Try to plot the ecliptic on this map, as a moderately thick line. This may involve converting RA, Dec of the Sun for an entire year into Galactic coordinates. The conversion formula is in the lecture slides.