*An introduction to*

# Milky Way Structure

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Take a moment to appreciate this.

How would we know we're in a Galaxy at all!?

# Milky Way Maps

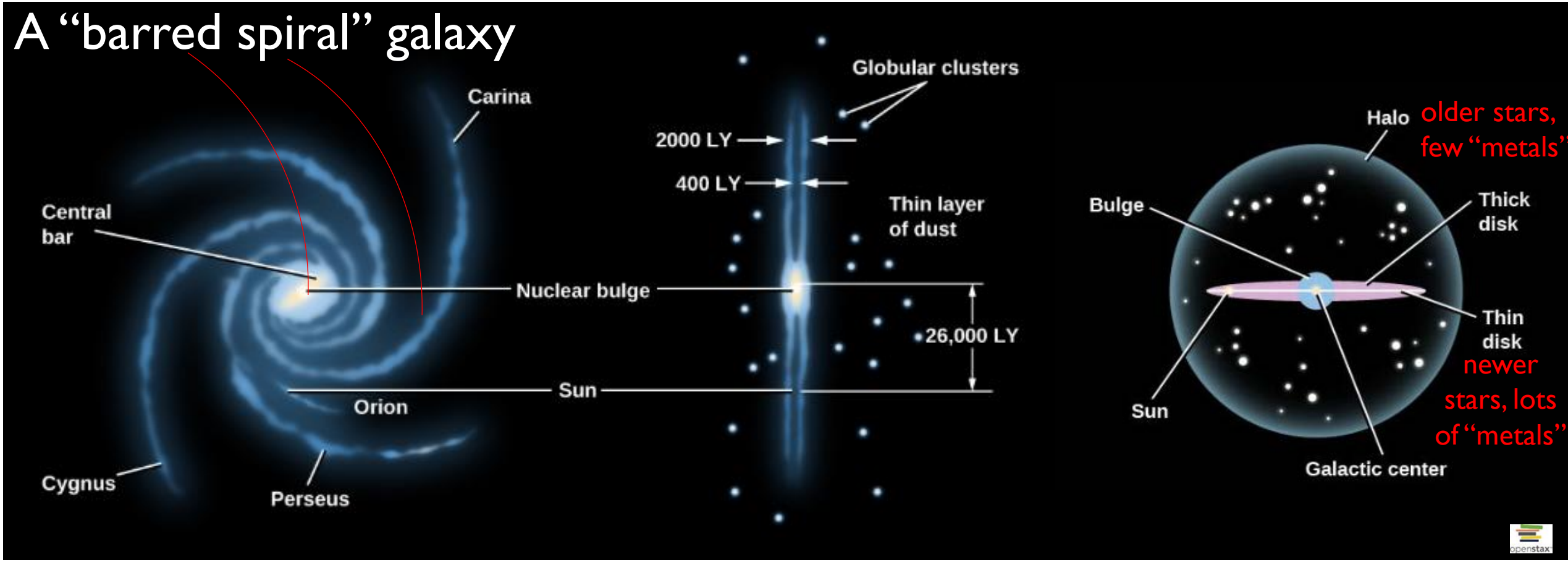
One key to determining the structure of the Milky Way is making full use of the electromagnetic spectrum


Jay Friedlander (SED Visualization Lab) & Seth Digel

# Milky Way Cousins

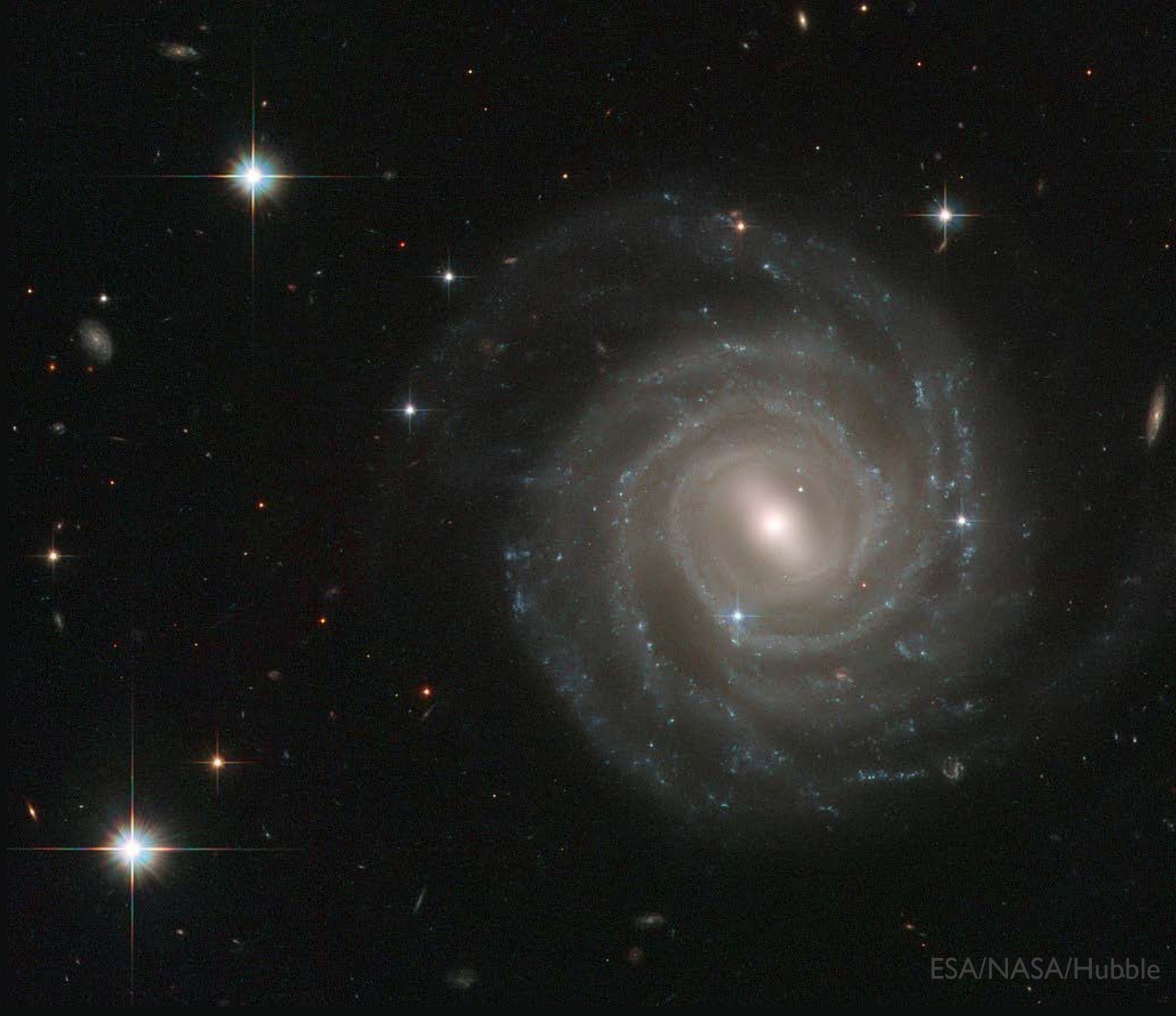
Another key is looking at lots of other galaxies

# This is as close as you'll get to seeing the Milky Way



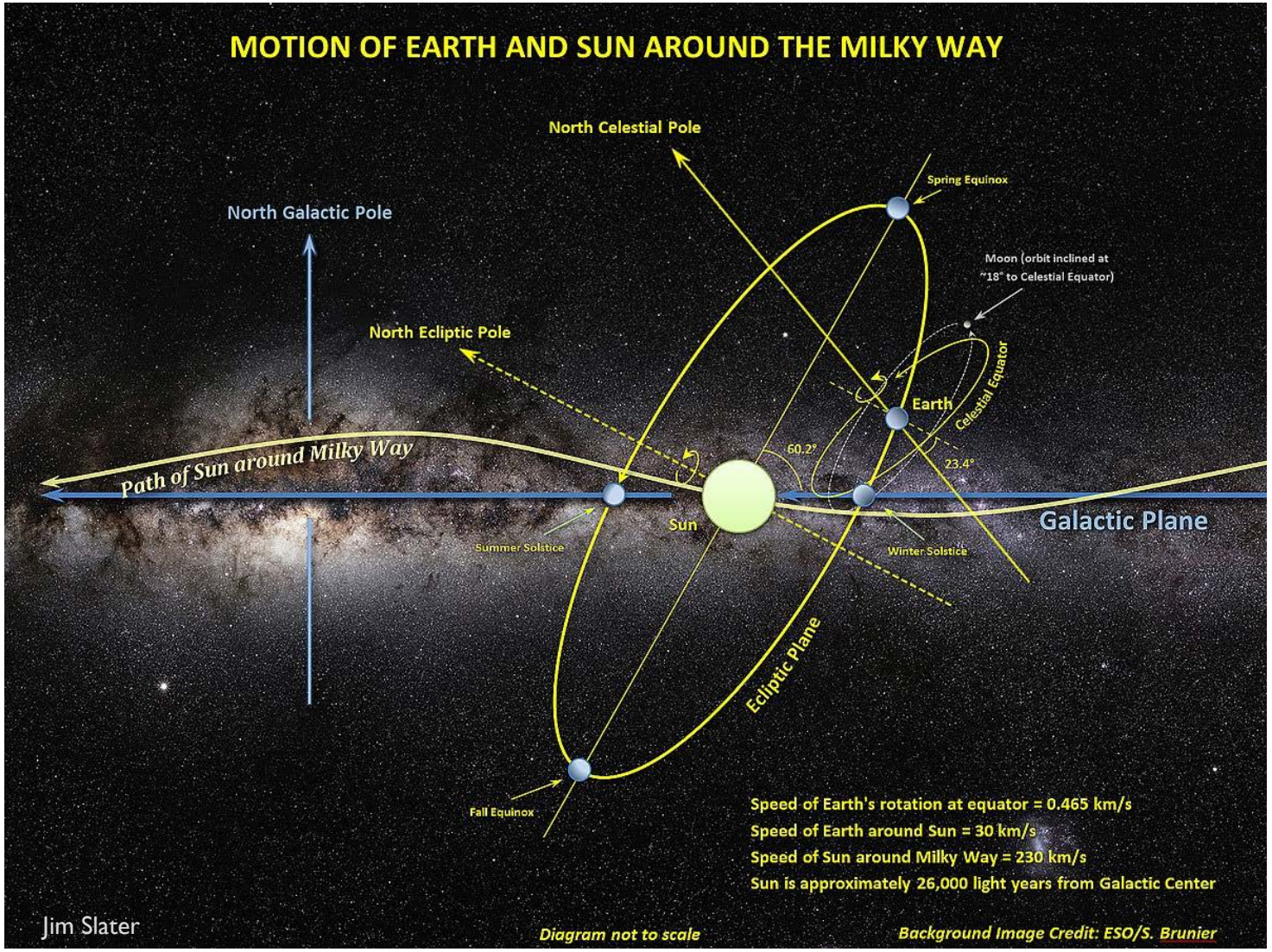
# …or maybe this is

This is of course not the Milky Way,
but UGC 12158 is thought to be very similar



# Milky Way Stats

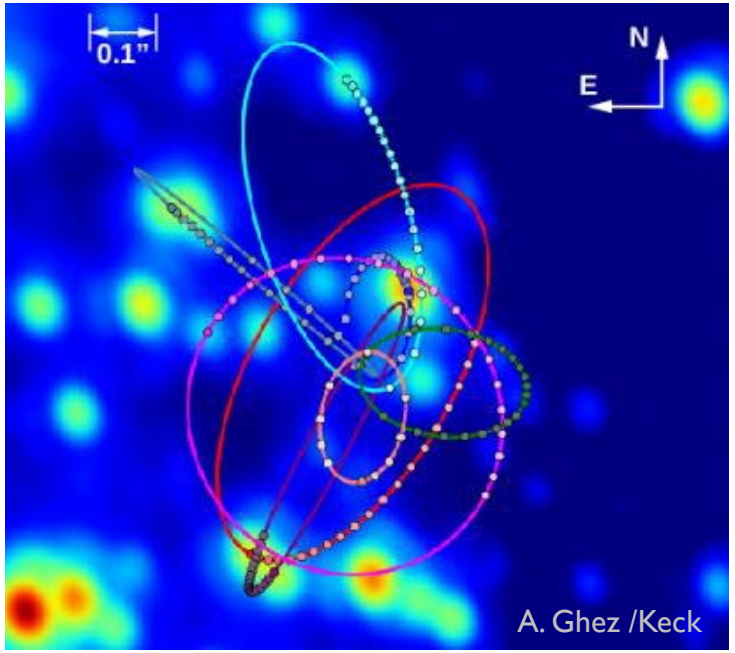
- $\sim 10^5\ ly$ in diameter
- $\sim 10^{12}\ M_\odot$, where
  - ~0.5% is in gas
  - ~5% is in ~ $10^{11}$ stars
  - and the rest is dark matter
- Roughly as old as the universe



# The center

- A dense concentration of stars known as the bulge is apparent in the infrared
- Tracking the motion of stars in this region reveals the presence of a supermassive black hole*

*These may sound fierce, but the tidal forces are actually roughly like those on Earth, so you wouldn't get spaghettified*





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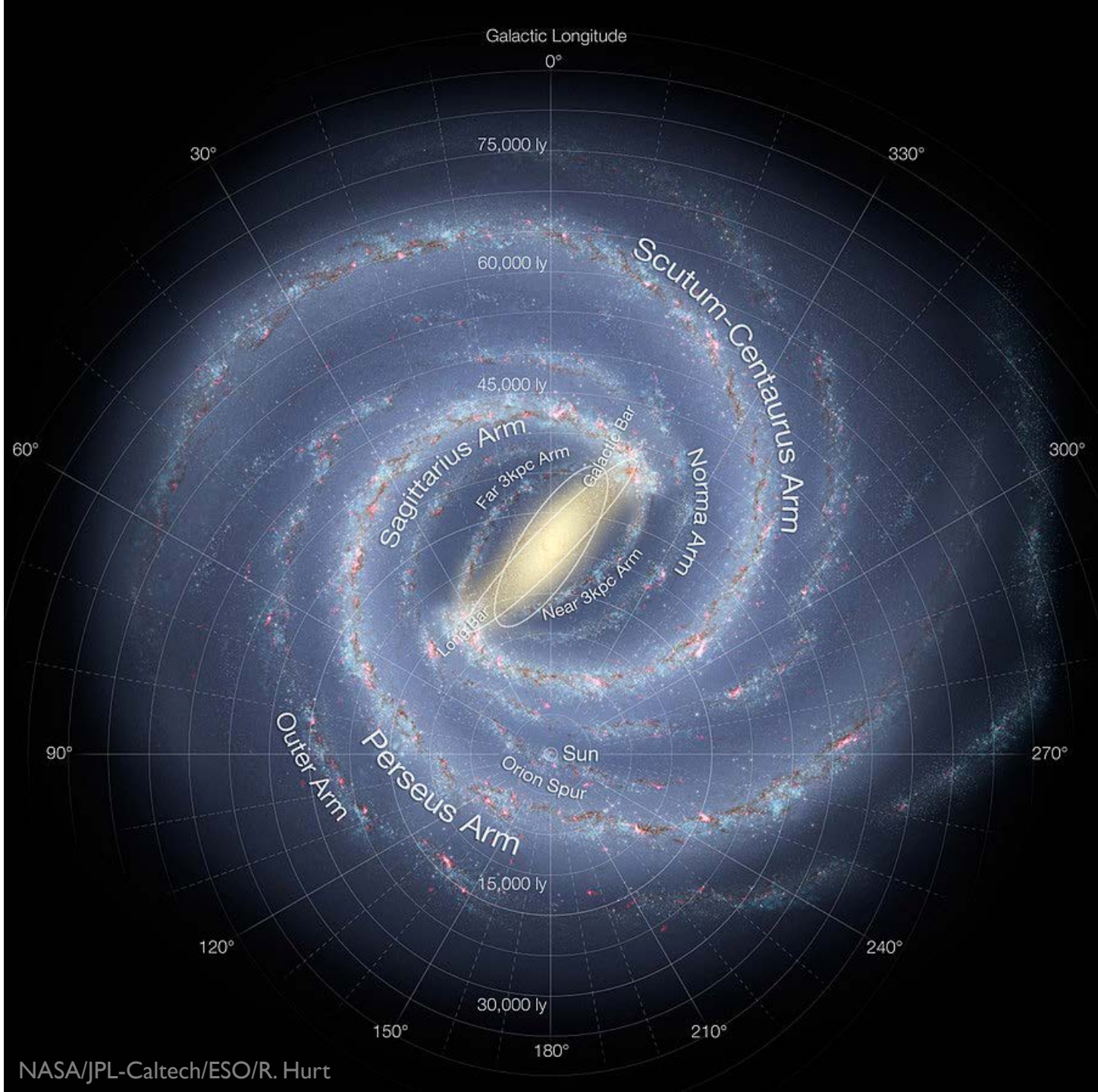
# The spiral arms

- The Milky Way spiral structure is up for some debate (because looking through a disk is hard)
- But, it seems two main spiral arms are the primary features
- We're located off a minor arm



# The halo

- Stars in the halo mostly orbit the galactic center out of the plane of the disk in a sort of random assortment of elliptical orbits
- Several groupings of stars orbit together, known as globular clusters.
  The stars in a globular cluster essentially all formed at the same time.
- Looking at the orbital speed of stars, it is clear that the halo (and the galaxy) is mostly a spherical blob of dark matter