Milky Way:
Structure, Kinematics and Remnants

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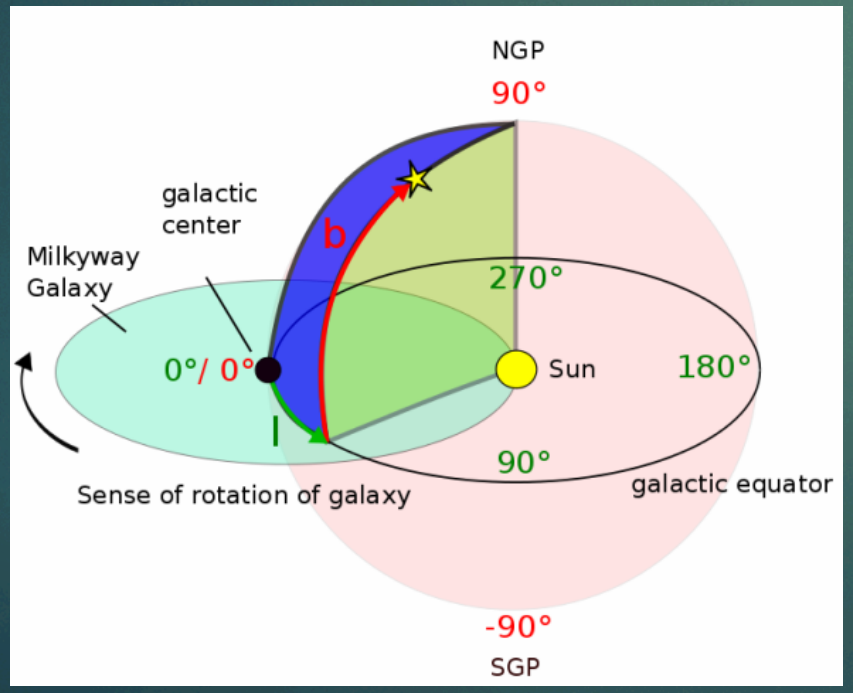
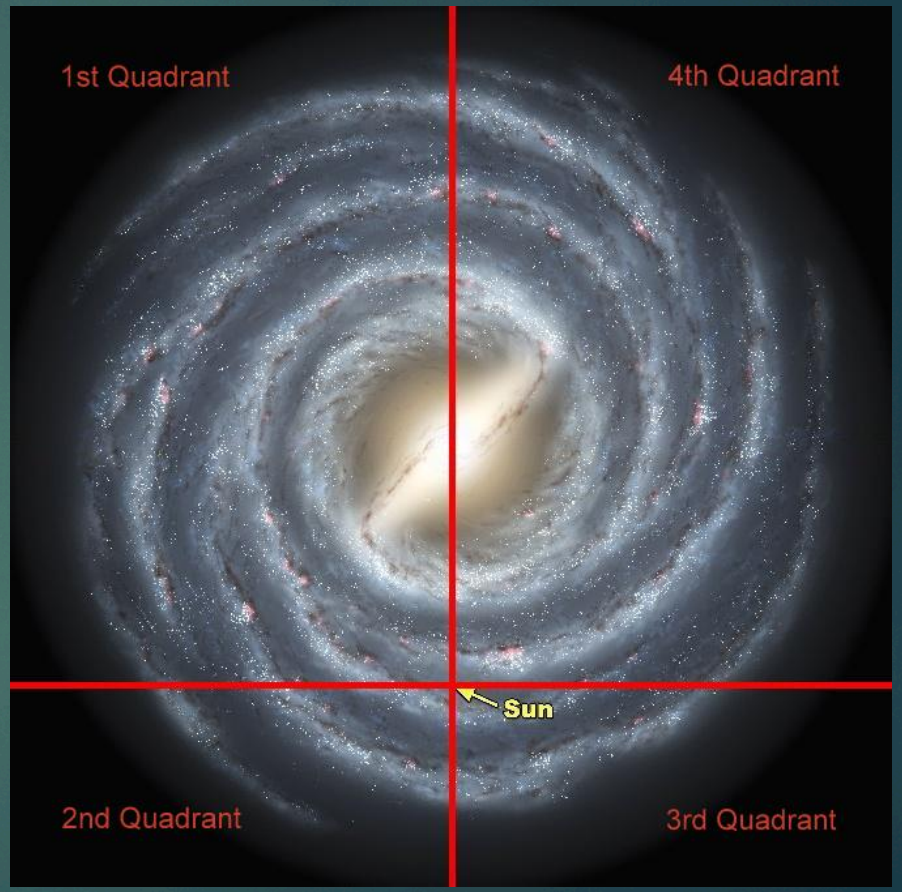
Structure

- Coordinate System
- Galactic Center
- Spiral Arms
- Halo

Galactic Quadrants

- Used to divide the objects into four areas
- Angle 0 is the line from the sun through the center of the galaxy.



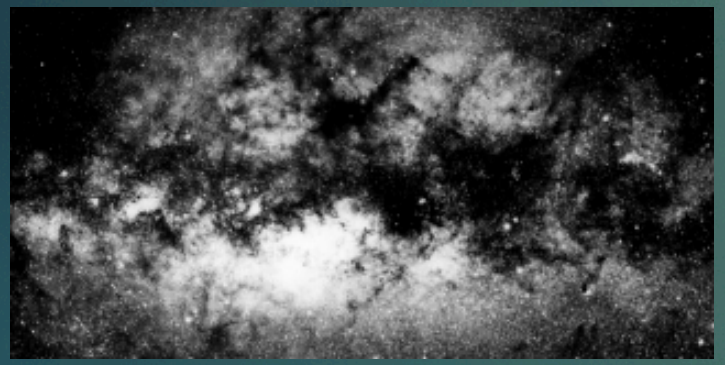


Galactic Center

Galactic Centre from the Paranal Observatory Chile

- It's appearance implies the galaxy type of the Milky Way. It is classified as a Bar-Spiral Galaxy (SBb).
- Estimated Distance: 7.6 – 8.7 kpc

Galactic Center

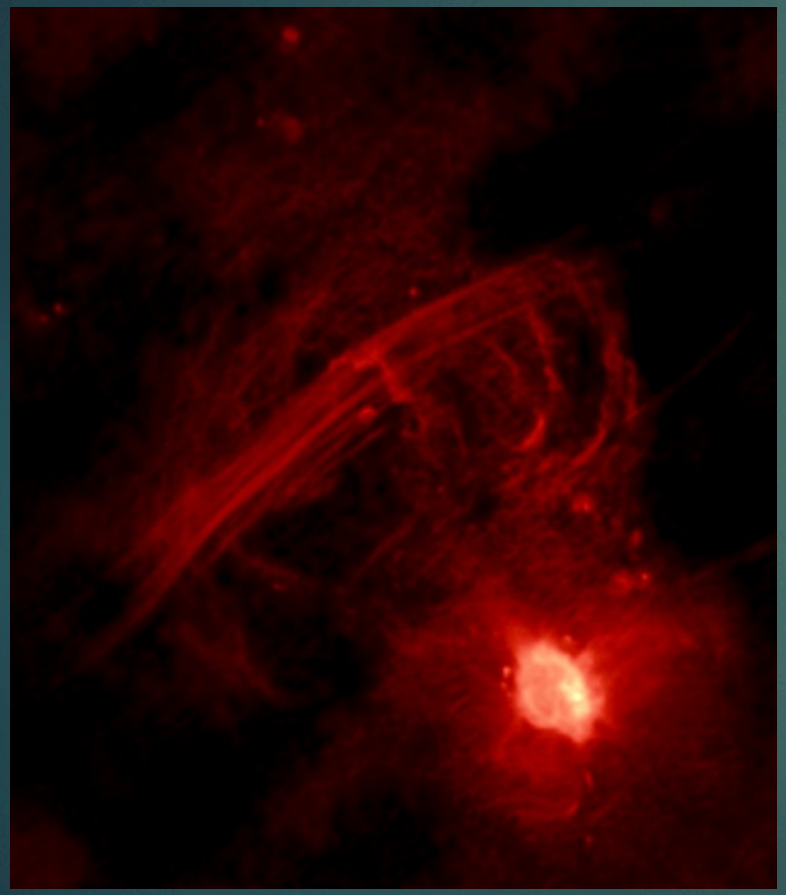


Visible Light

Near-Infrared Light

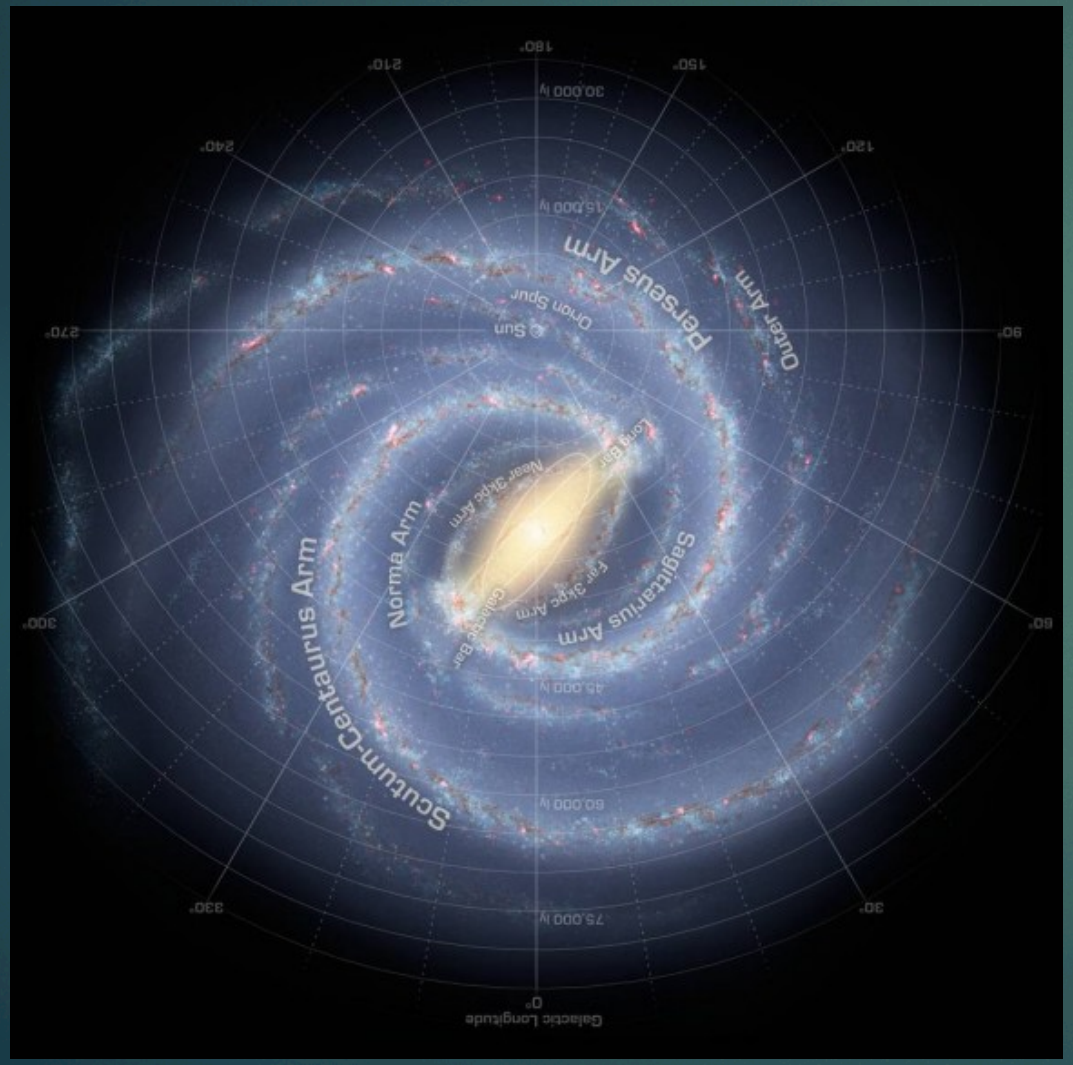
Infrared Light

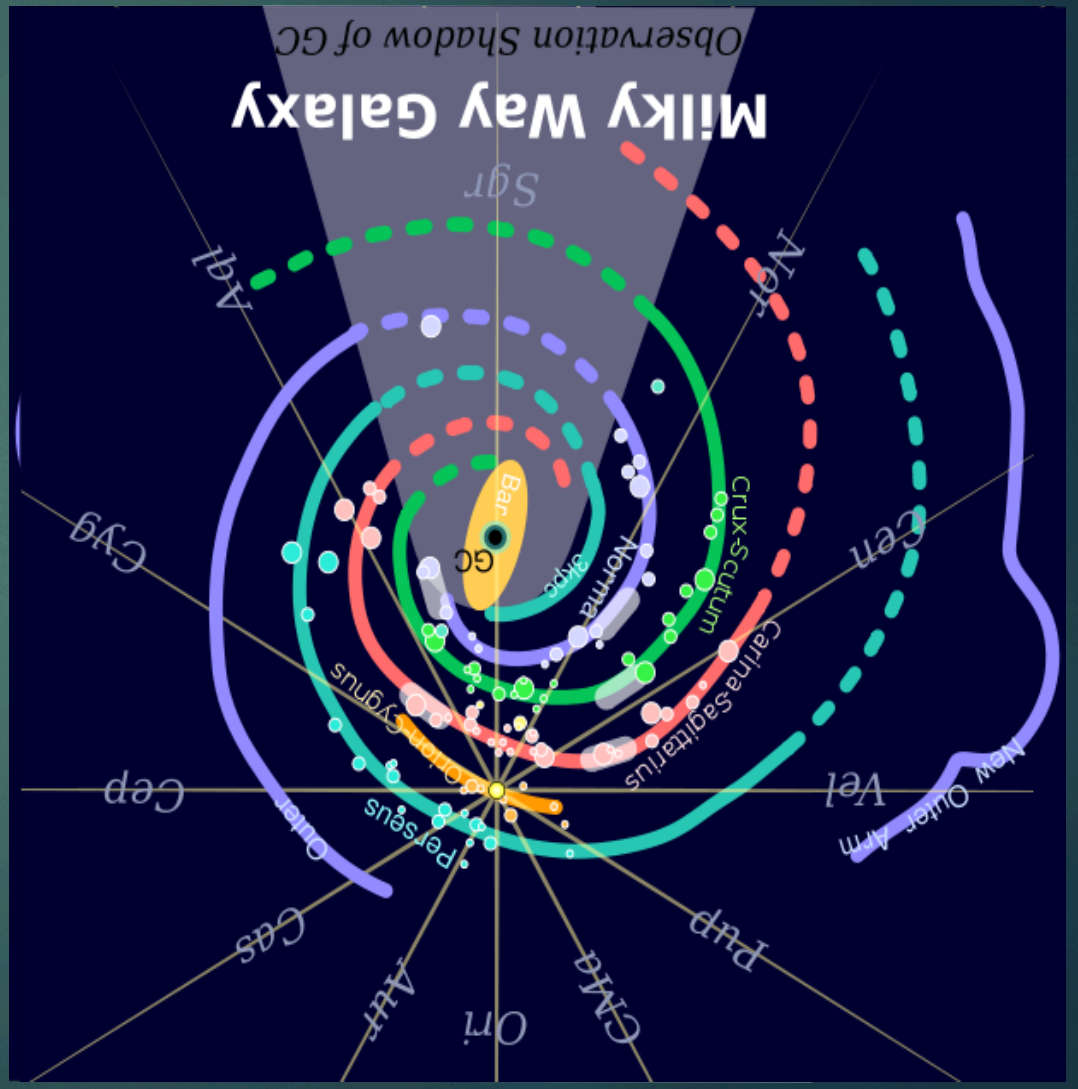
Sagittarius A*



- Est. Mass: (4.31 ± 0.38) × 10^6 M⊙
- Due to its mass, it is thought of to be a super massive black hole.
- The presence of old stars around it merits the young star paradox

Spiral Arms

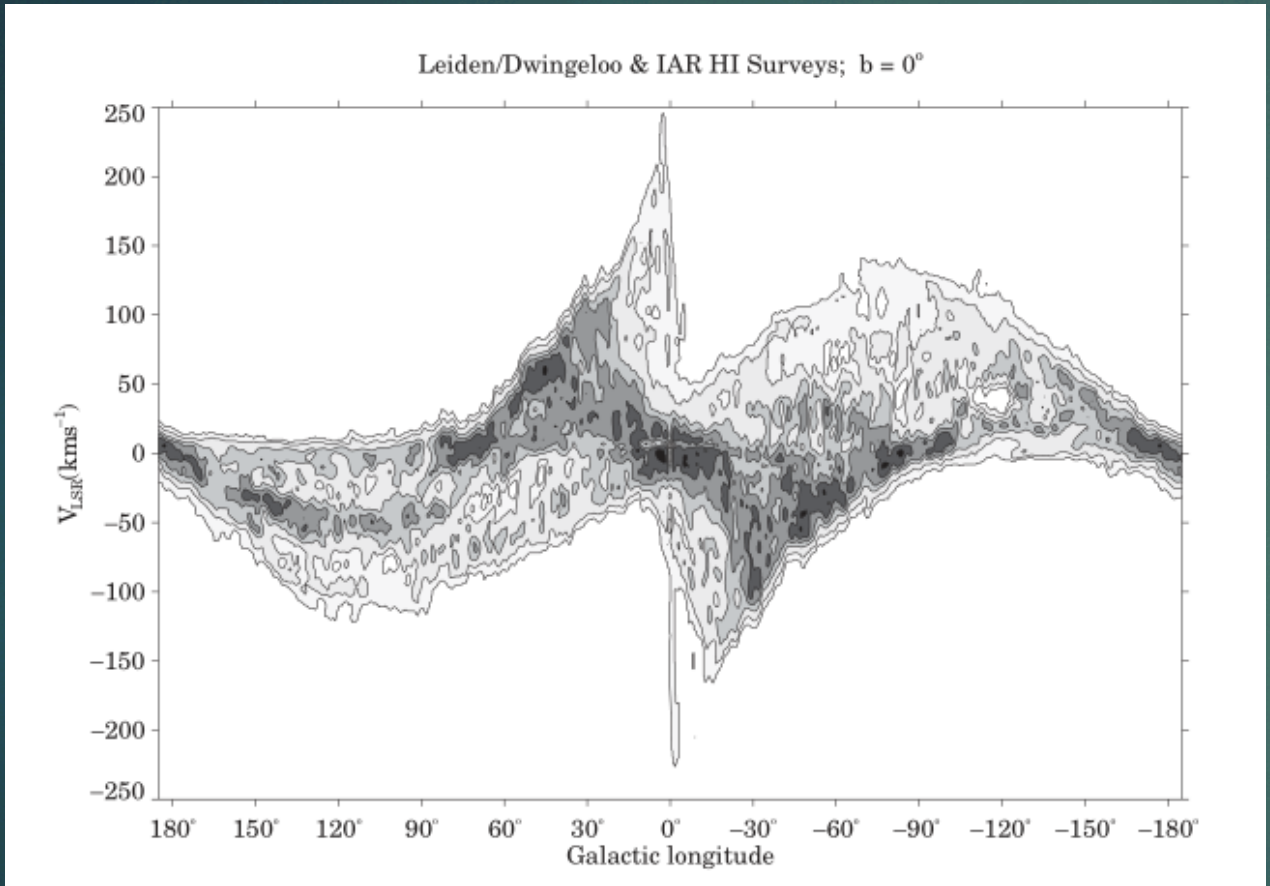

Perseus Arm
Outer Arm
Sagittarius Arm
Norma Arm
Scutum-Centaurus Arm
Sun
Orion Spur
Galactic Longitude


Milky Way Galaxy
Observation Shadow of GC
Sgr
Aql
Nor
Cyg
Cen
Cep
Vel
Per
Cas
Aur
Ori
Pup
Cma
Perseus
Outer
Carina-Sagittarius
Crux-Scutum
Norma
3kpc
Bar
GC
Outer-Cygnus
New Outer Arm

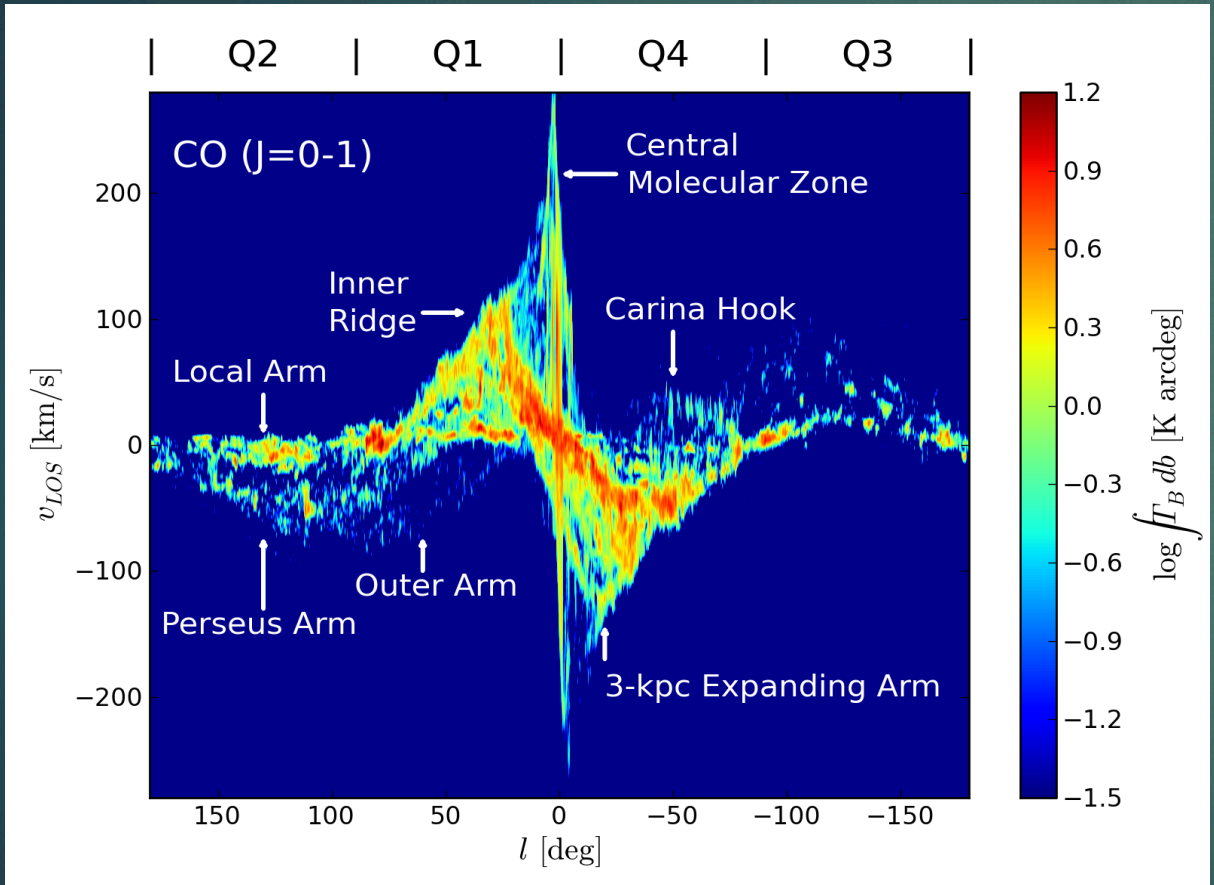
Galactic Kinematics

- Rotation
- Velocity Plots

Milky Way Rotation

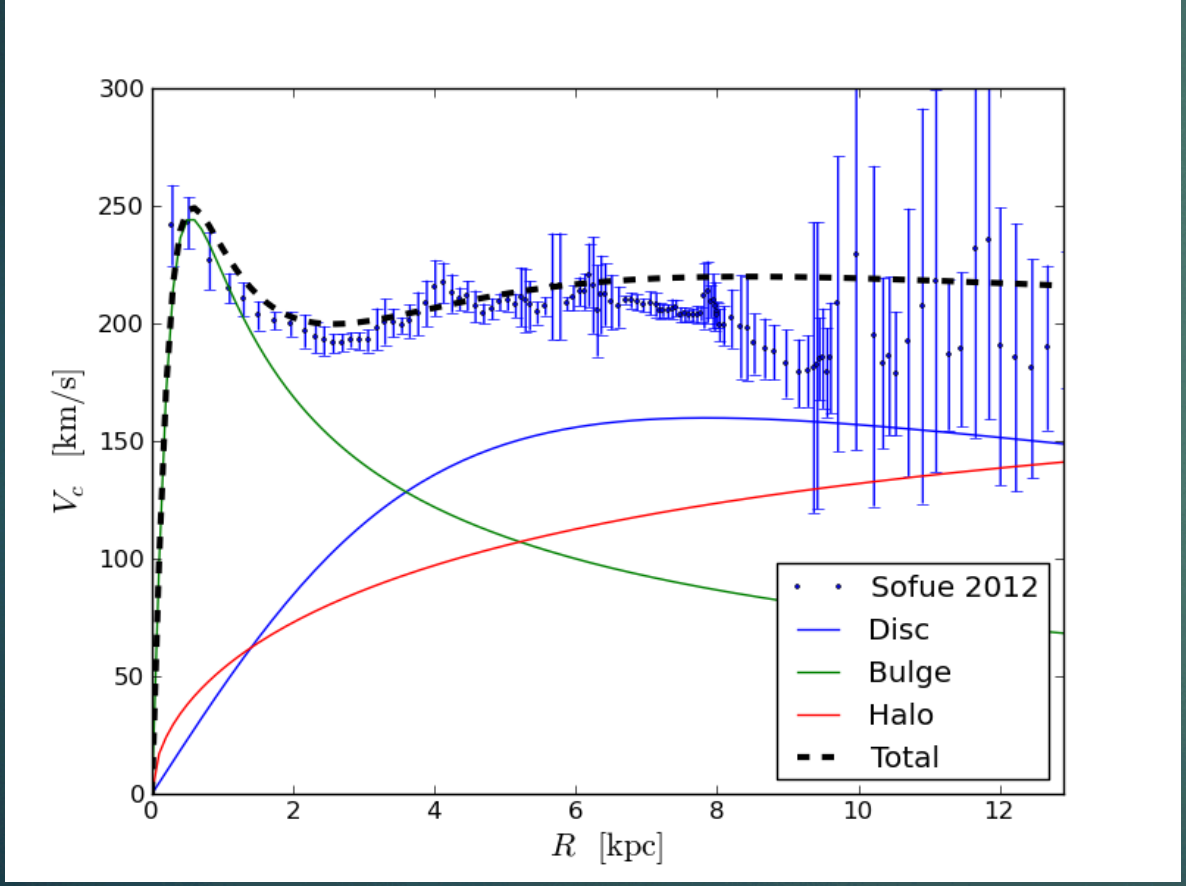


Milky Way Rotation



The morphology of the Milky Way

Rotation Curve



Formation of the Milky Way

- Stellar population and it's distribution allows us to see structures within the early Milky Way Galaxy.

- Observing Milky Way-like galaxies to see how they evolve.

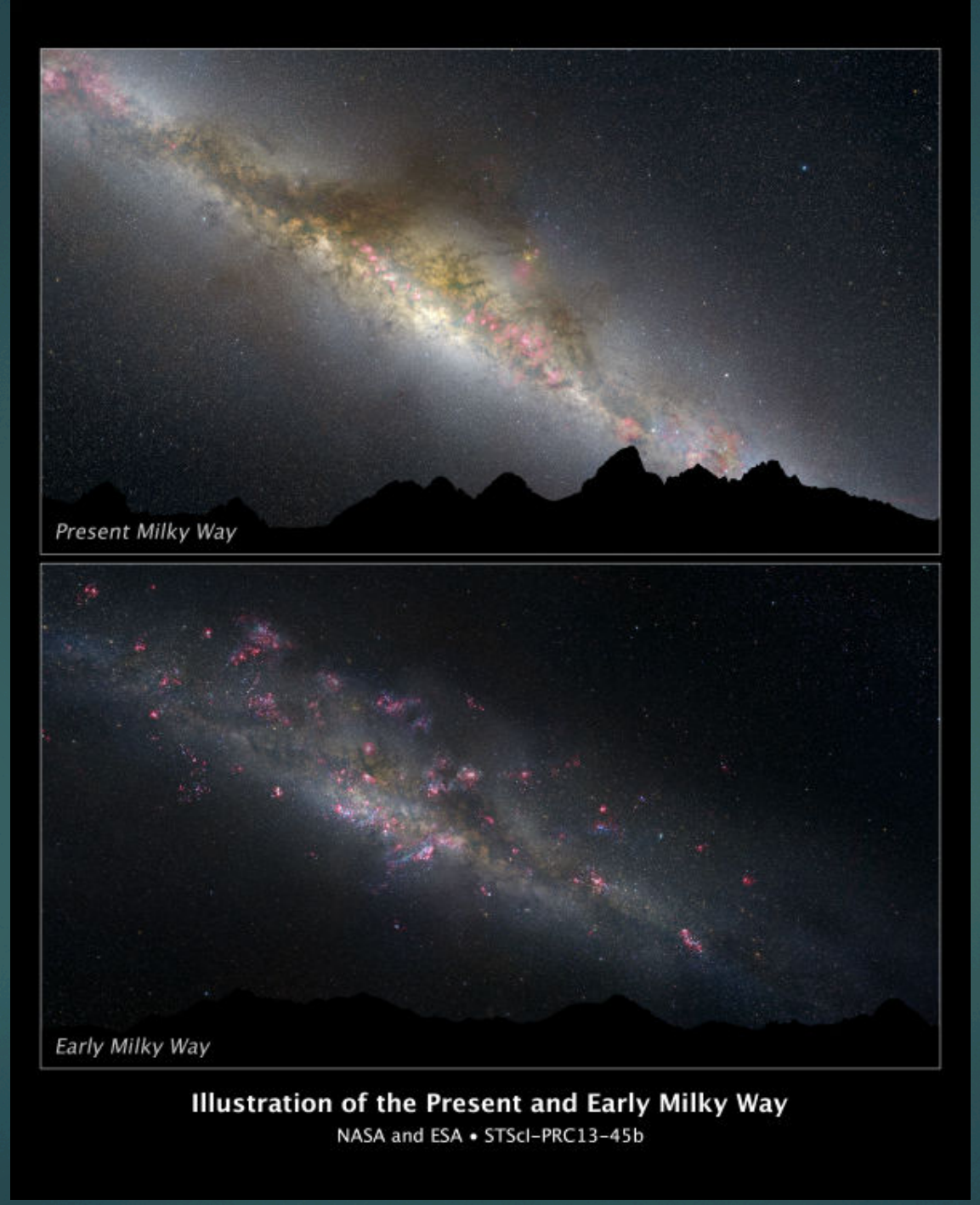


Illustration of the Present and Early Milky Way

NASA and ESA • STScI-PRC13-45b

References

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