

MASS MEASUREMENT OF THE MILKY WAY

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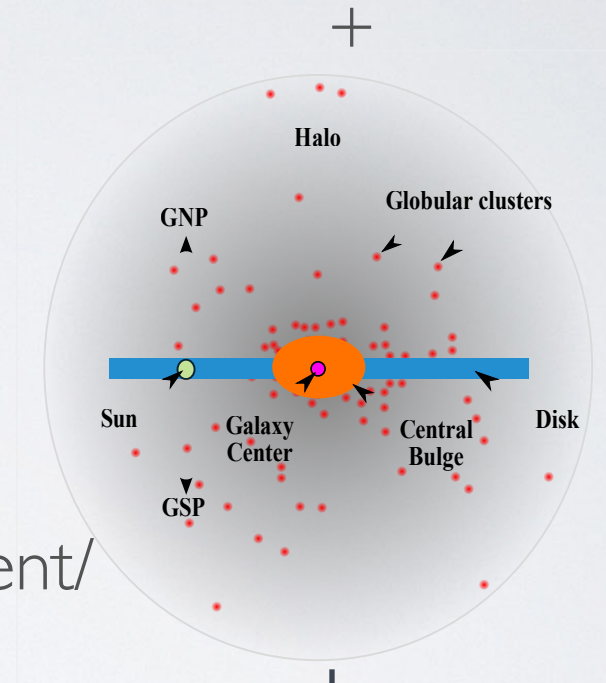
WHY SHOULD WE CARE

MASS



Photometric Measurement/
Luminosity Function

M/L Ratio



Mass M

Galaxy Structures

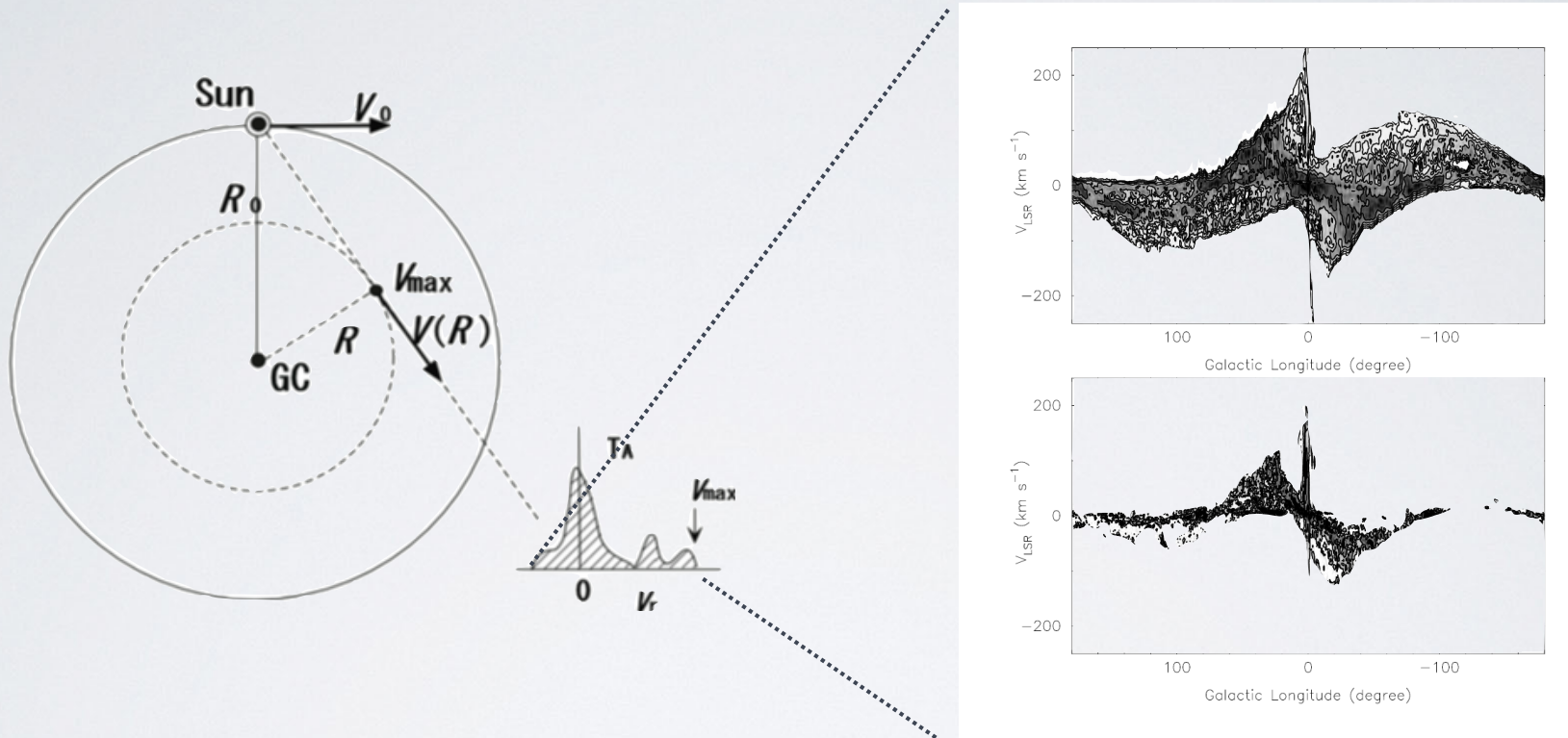
HOW TO MEASURE

Rotation Curve
— Observational

$$-\nabla\Phi(R) = \frac{V^2(R)}{R}$$

Mass Model
— Theoretical

OBSERVATIONAL CONSTRAINTS — INNER GALAXY



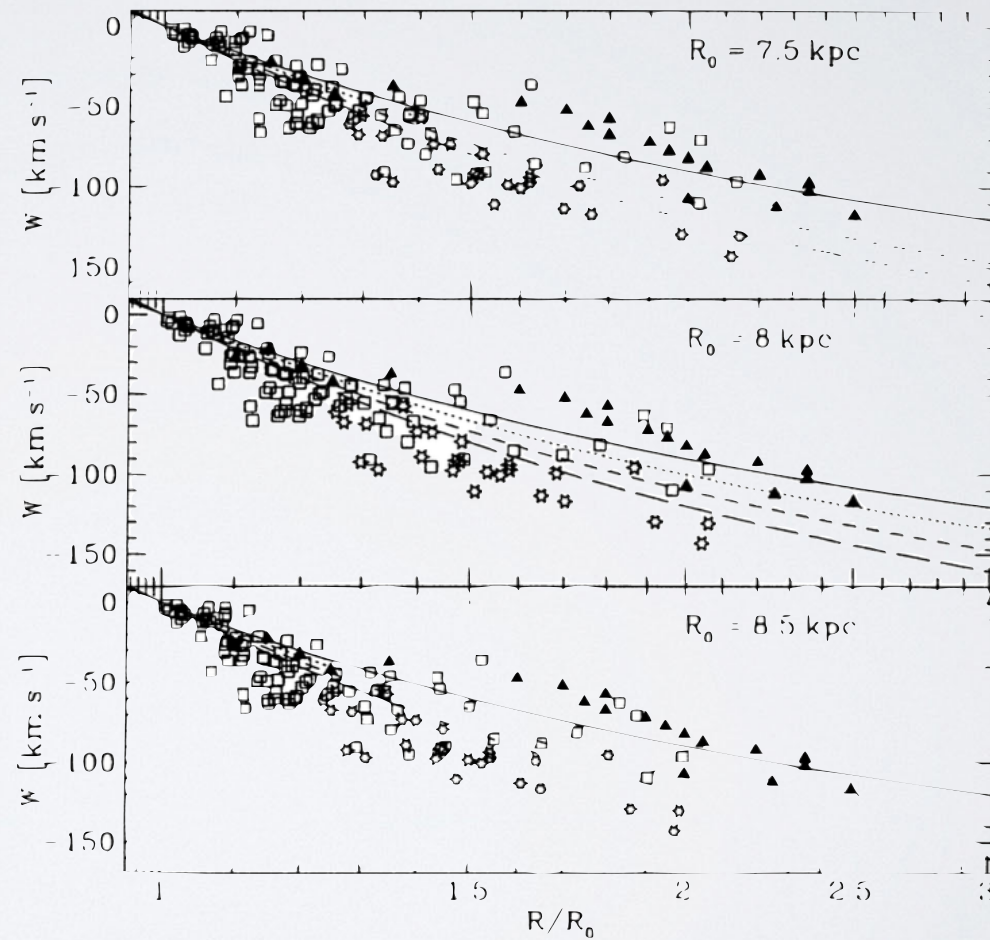
$$R = R_0 \sin(l)$$

$$V(R) = V_{\max} - V_0 \sin l$$

H I 21 cm line often

OBSERVATION CONSTRAINS — OUTER GALAXY

- Distance and relative velocity needed
- H II region
- Cepheids
- H I 21 cm lines
- Galactic Maser (Parrallexes)



OTHER CONSTRAINS

- Mass at large radii ($R > 100$ kpc)

Satellite Galaxies

- Local Surface Density

MODEL

- **Disk**

Double Exponential Profile, thin and thick

- **Bulge**

prolate, triaxial rotating bar

or axisymmetric approximation

- **Halo**

With a Given Profile

HOW COULD WE BE BETTER?

- Better Measurement with outer galaxy rotation curve
- Better constraints on the larger radii structure
- Improvement of the mass models