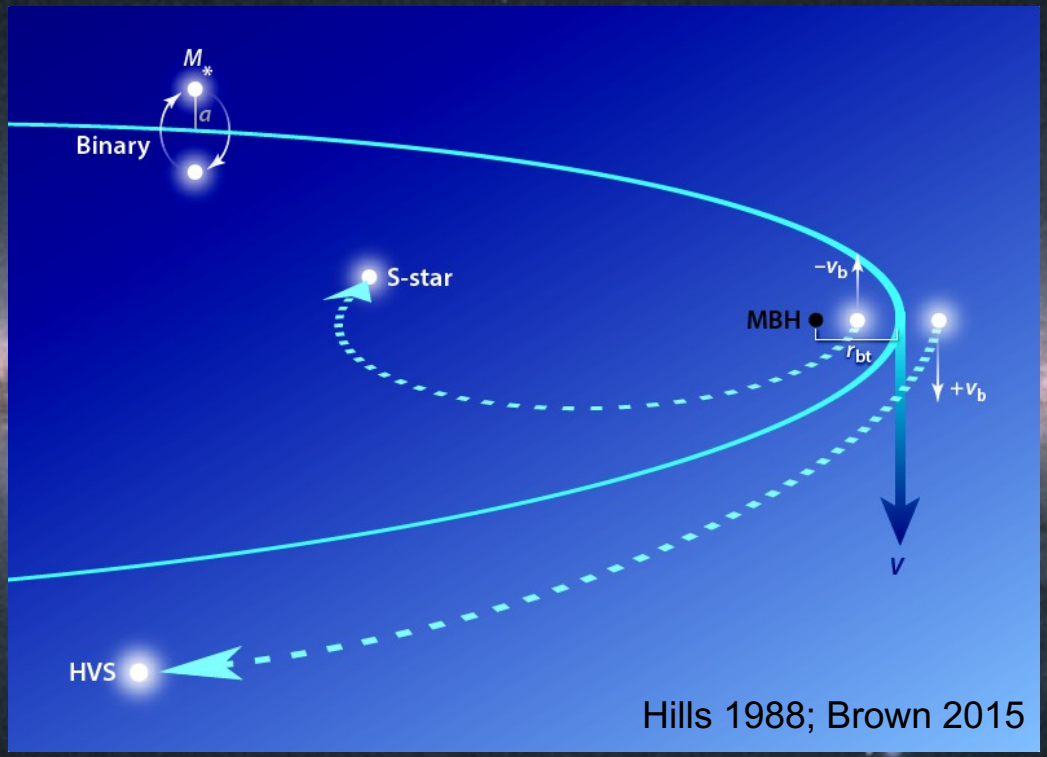
Gaia and the Galactic Center
Origin of Hypervelocity Stars



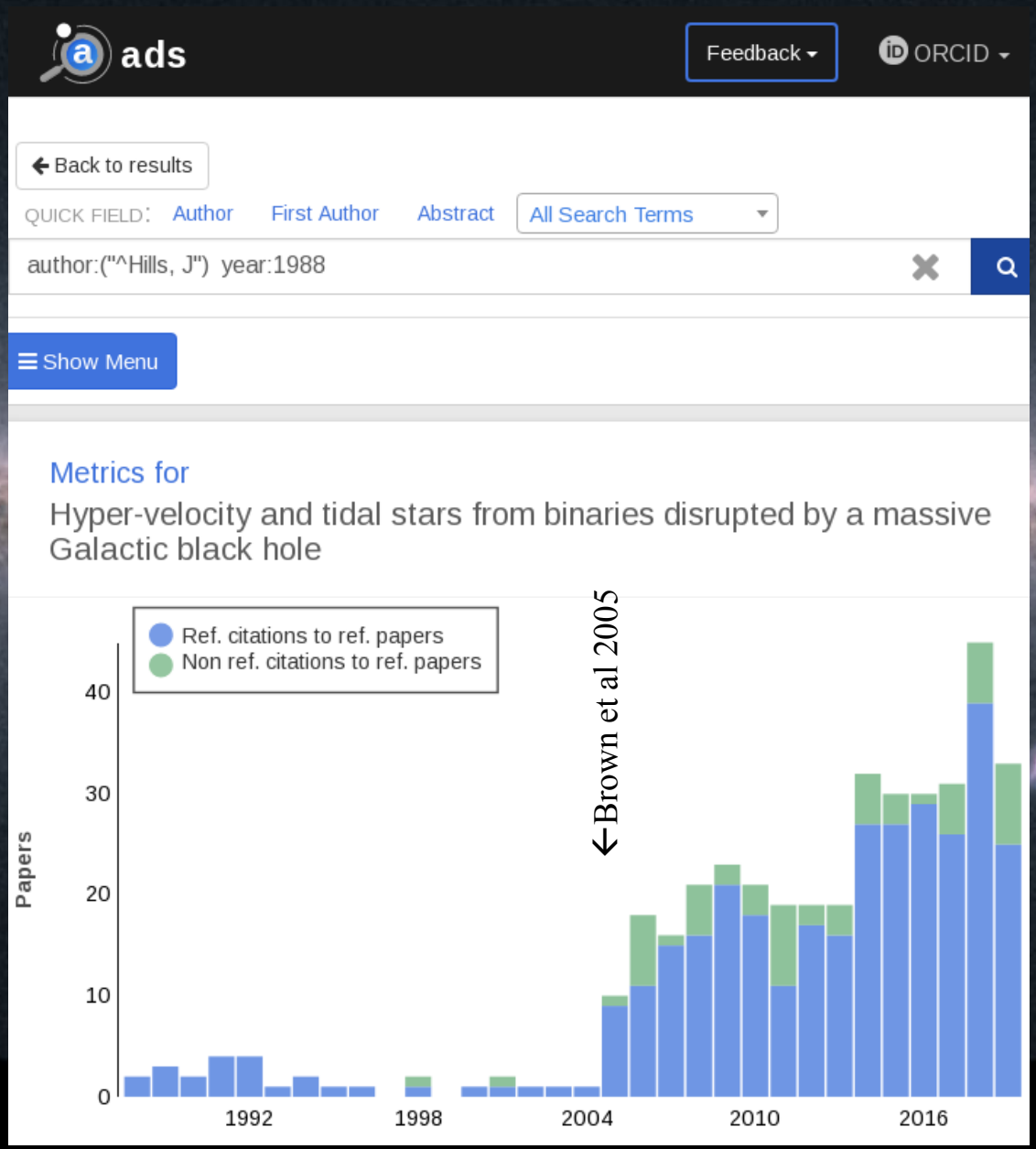
Warren R. Brown

Center for Astrophysics | Harvard & Smithsonian

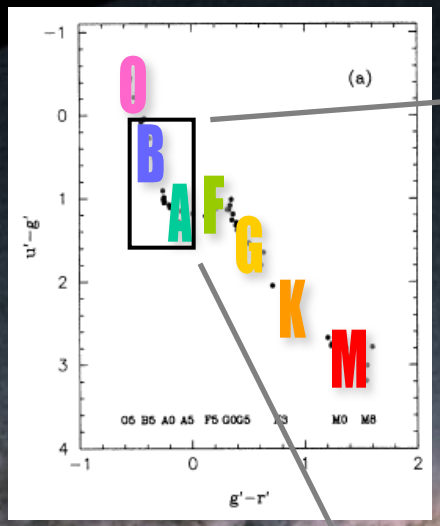
Collaborators: Margaret Geller, Scott Kenyon

Image: *Gaia* DR2 point source catalog

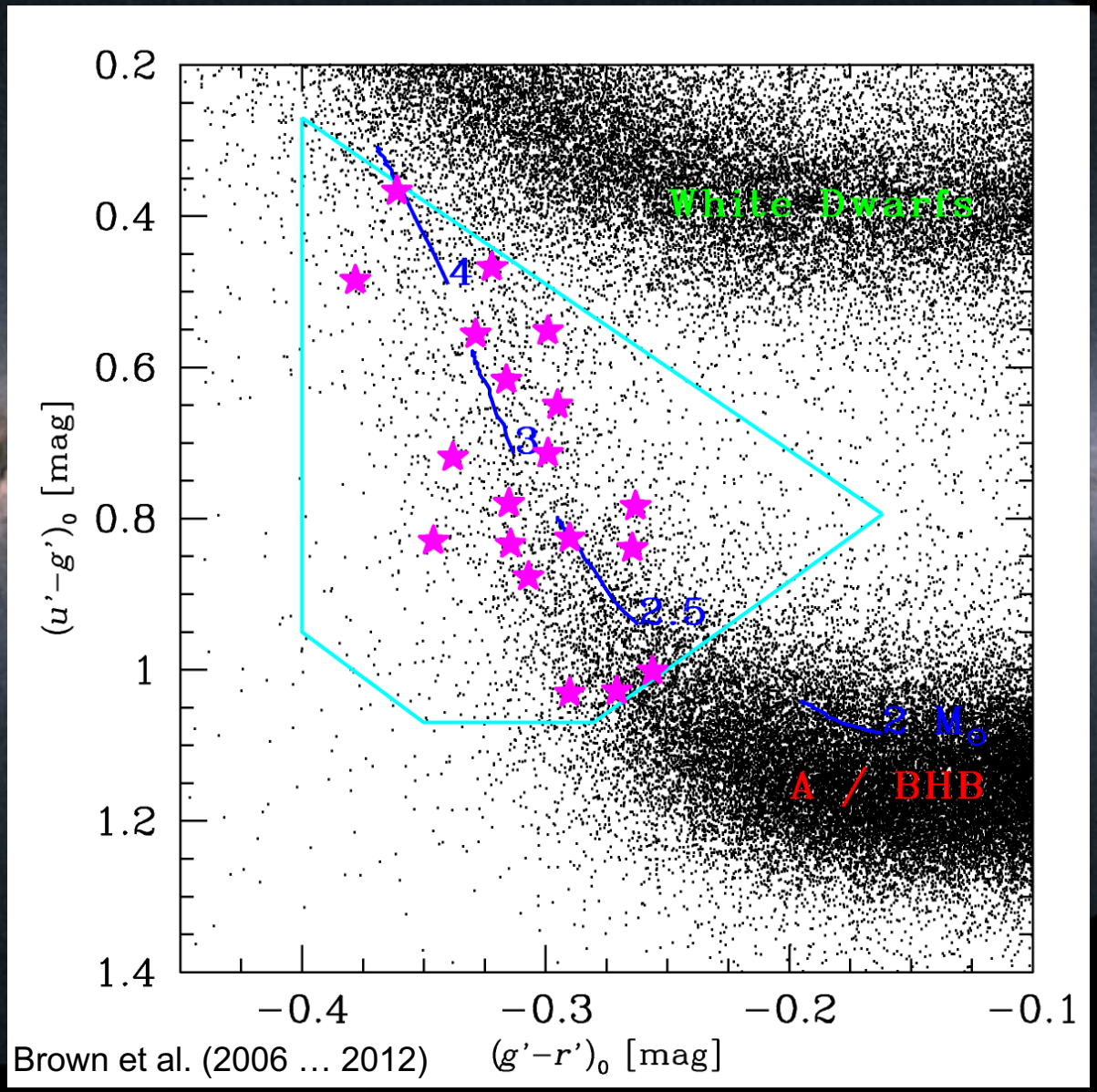
Hills 1988


ads
Feedback
ORCID
Back to results
QUICK FIELD: Author First Author Abstract All Search Terms
author:("^Hills, J") year:1988
Show Menu
Metrics for
Hyper-velocity and tidal stars from binaries disrupted by a massive Galactic black hole
Ref. citations to ref. papers
Non ref. citations to ref. papers
Papers
0
10
20
30
40
1992
1998
2004
2010
2016
←Brown et al 2005

The HVS Survey

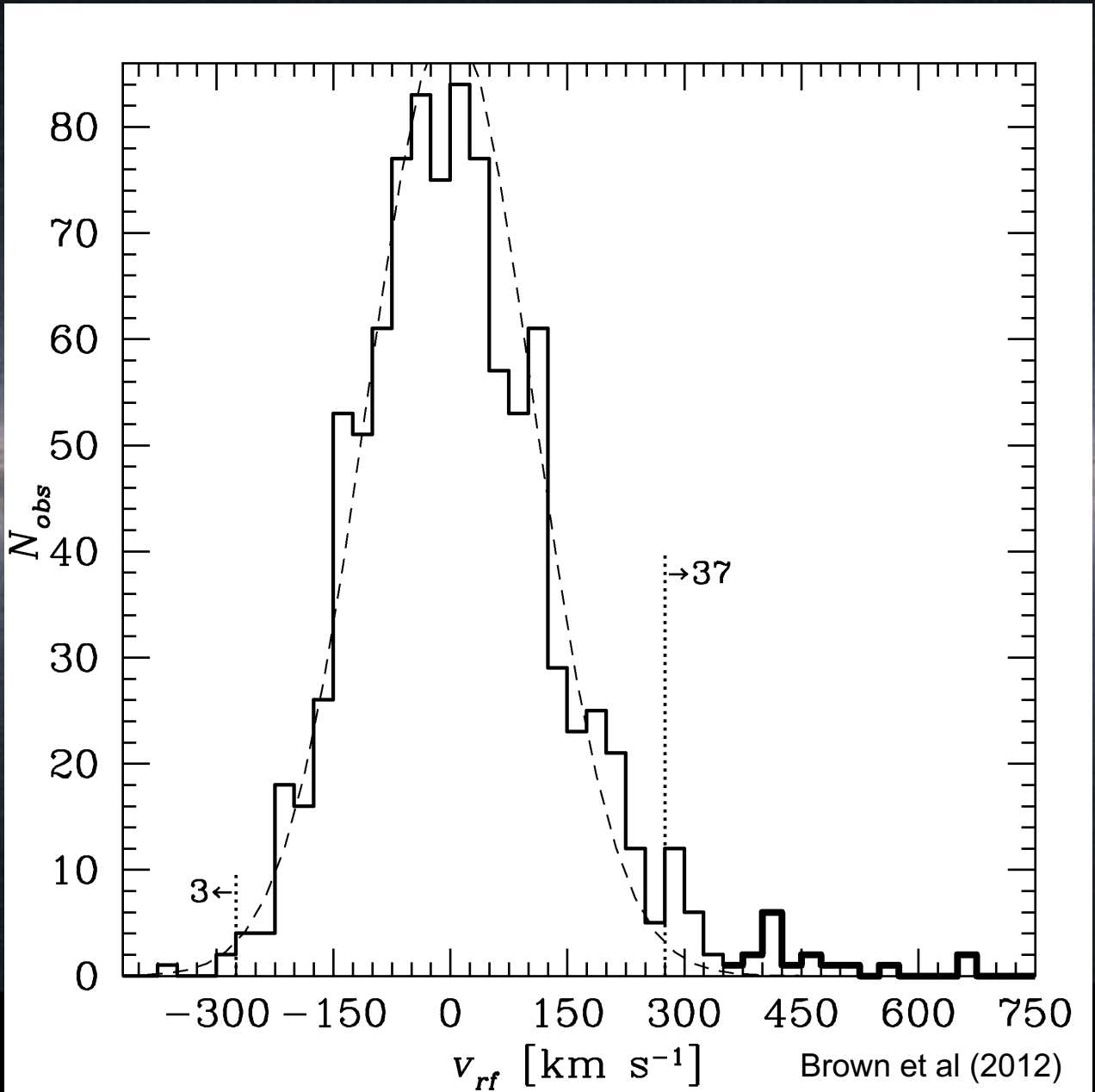


Fukugita et al (1996)

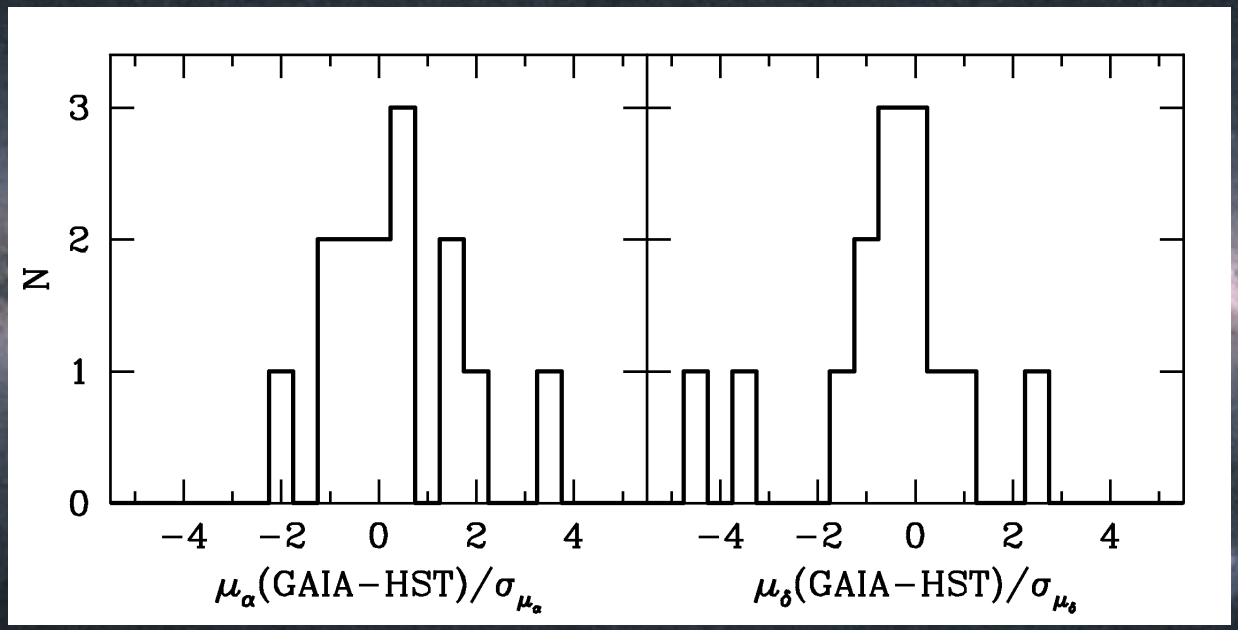


Brown et al. (2006 … 2012)

Radial Velocity Distribution

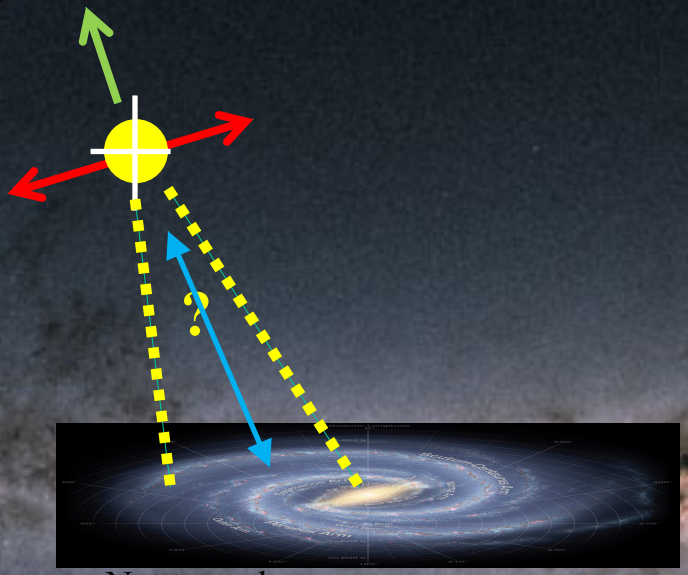


Proper motions



Brown et al 2015, 2018

Trajectories



Not to scale.

Measured Accurately:

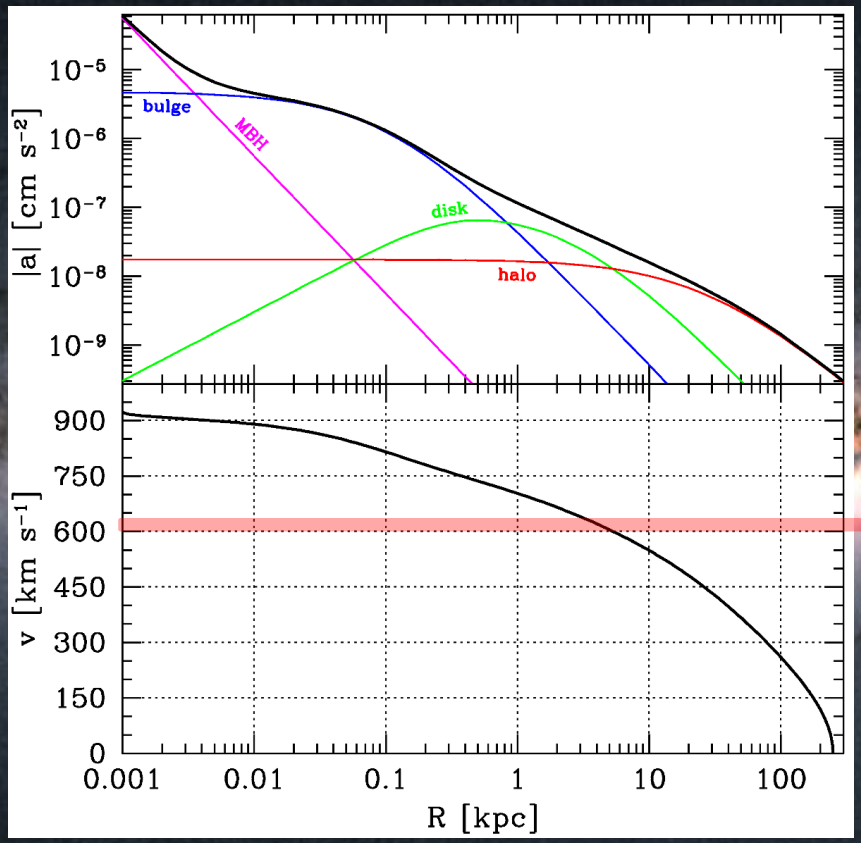
- **Position ~mas**
- **Radial velocity ~km/s**

Measured Less Accurately:

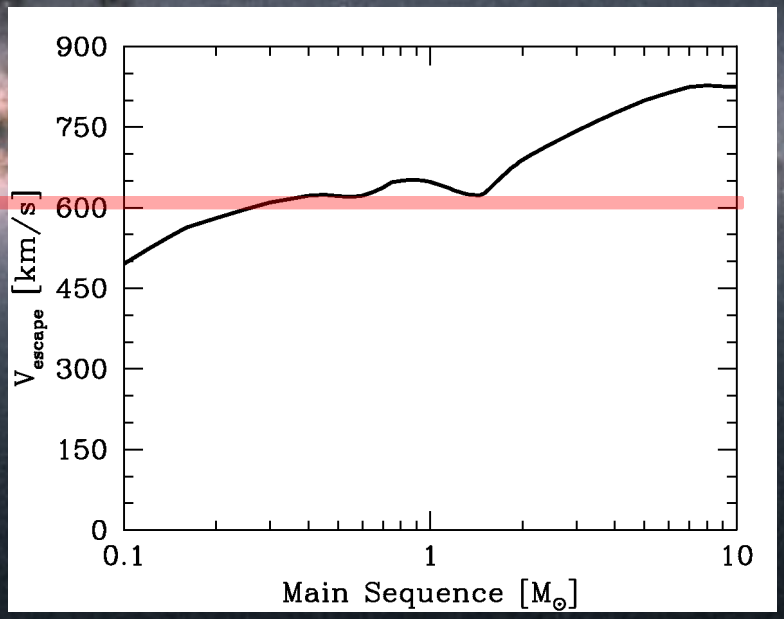
- **Proper motion ~mas/yr**
- **Heliocentric distance ~kpc**

(…tangential velocity is the product)

Velocity and gravity



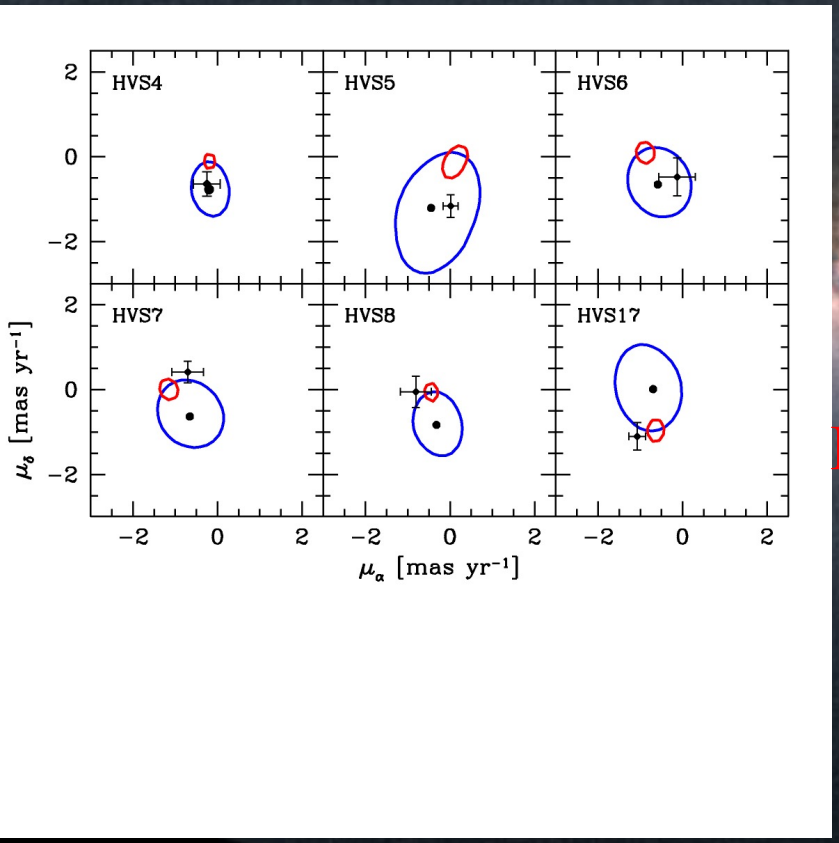
adapted from Kenyon et al. (2014)



computed from Padova tracks

Trajectories in Proper Motion space

Unbound stars



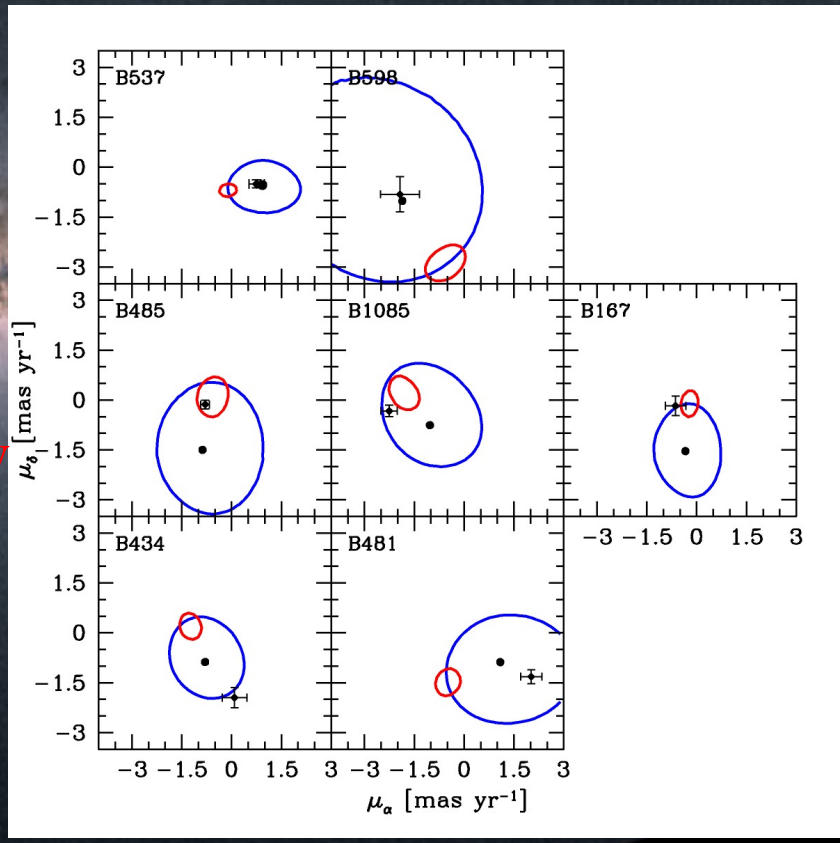
Brown et al. (2018)

HVS

Disk Runaway

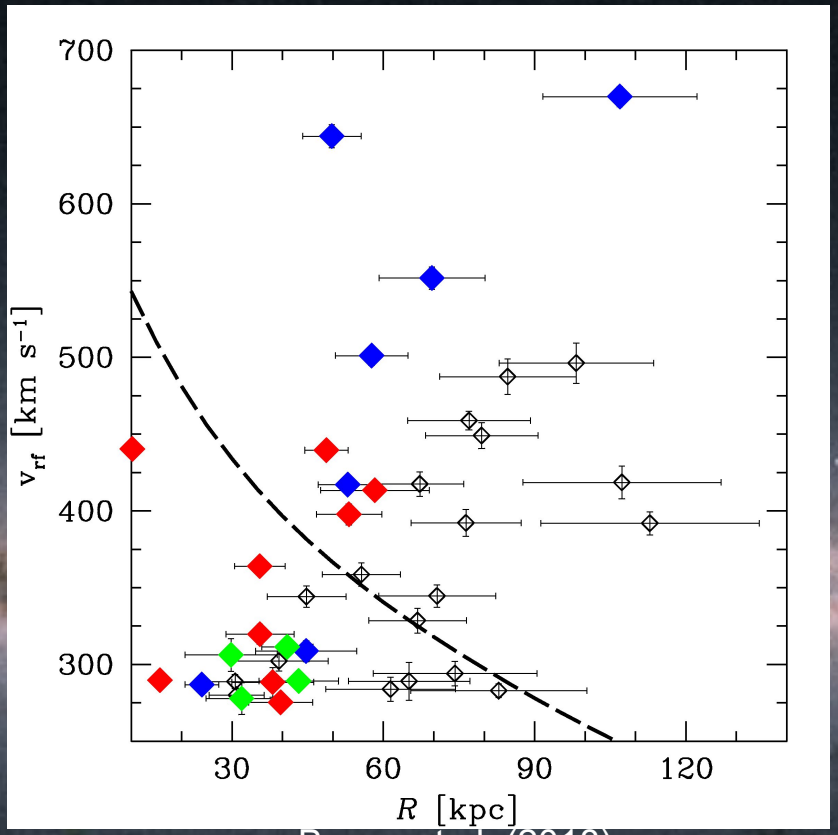
Halo Star

Bound stars

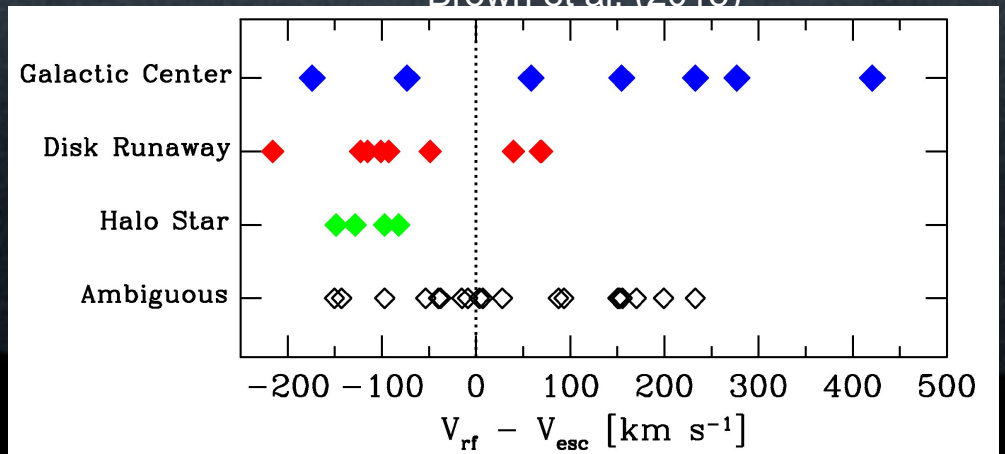


Brown et al. (2018)

Final Result



Brown et al. (2018)

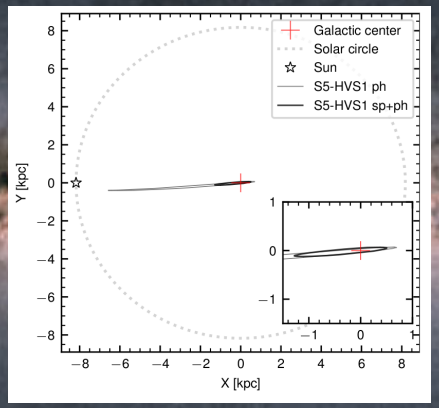


Gaia: over-lapping populations

Disk Runaways

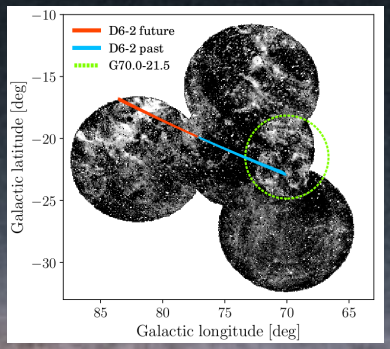
Heber et al (2008)
Boubert et al (2018)

Galactic Center HVS



Brown et al (2005)
Koposov et al (2019)

Type Ia SNe



Hirsch et al (2005)
Shen et al (2018)

Halo stars

Ziegerer et al (2015)
Hattori et al (2018)

LMC

Edelmann et al (2005)
Erkal et al (2018)

Image: *Gaia* DR2 point source catalog