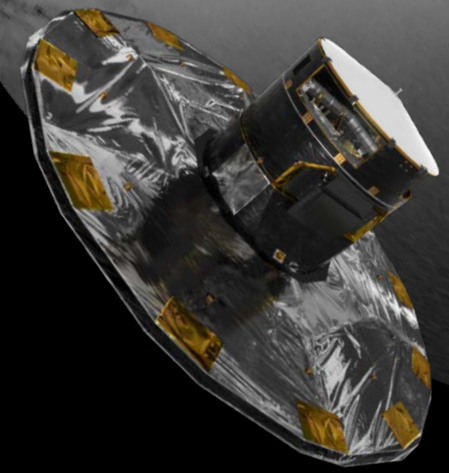
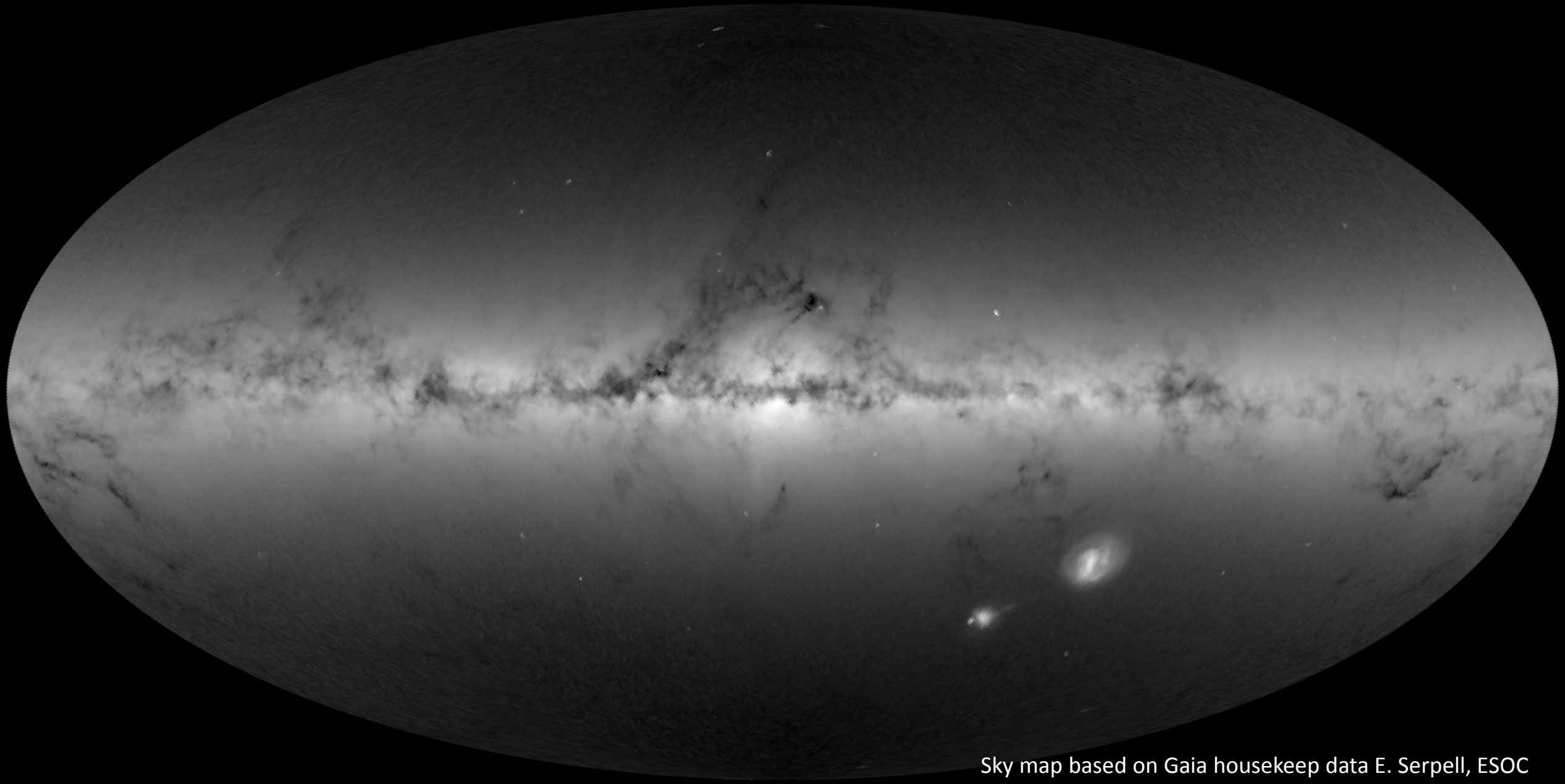
Galactic dynamics results from the Gaia Sky Version 1.0

Anthony Brown
Leiden Observatory, Leiden University

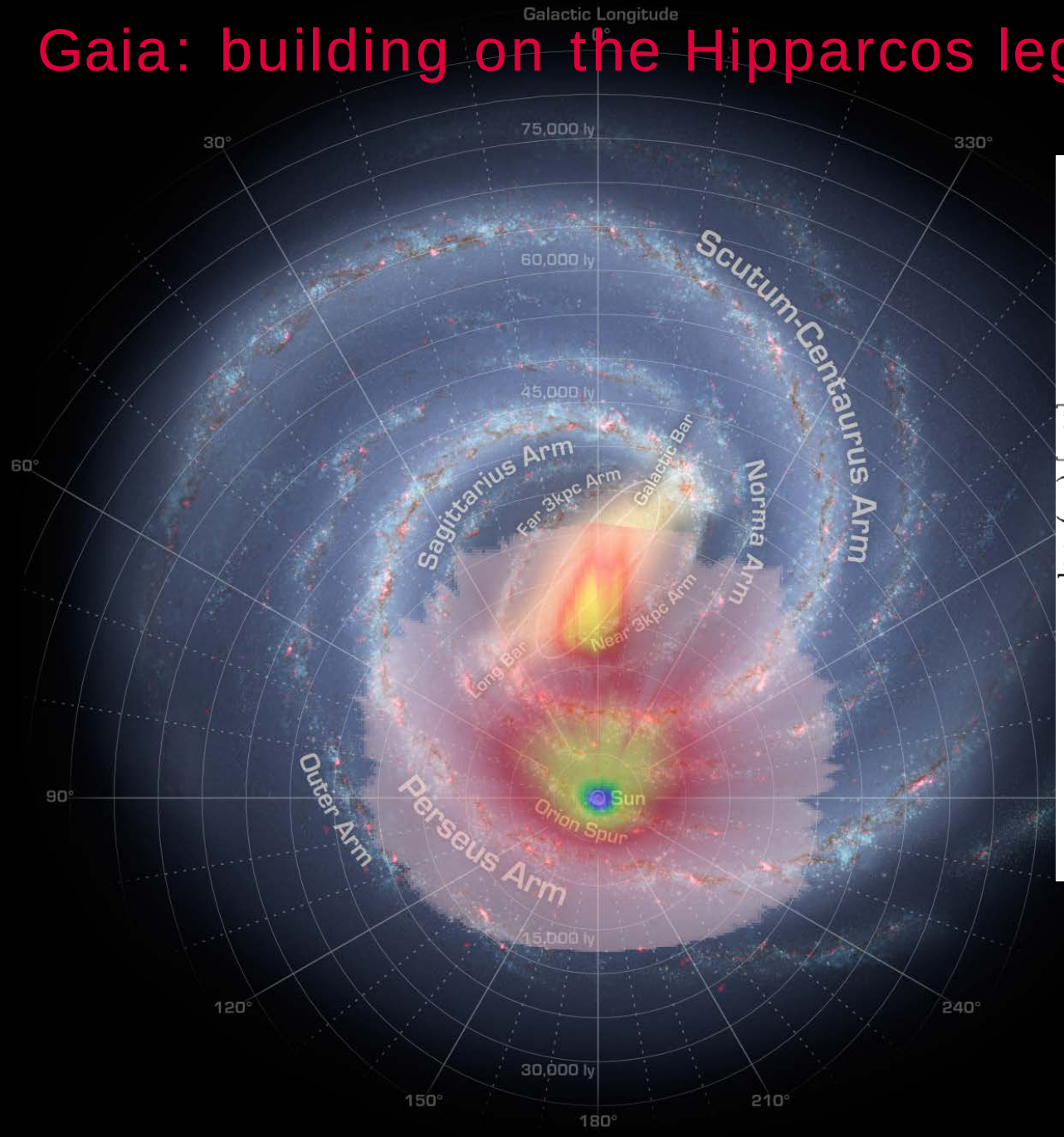


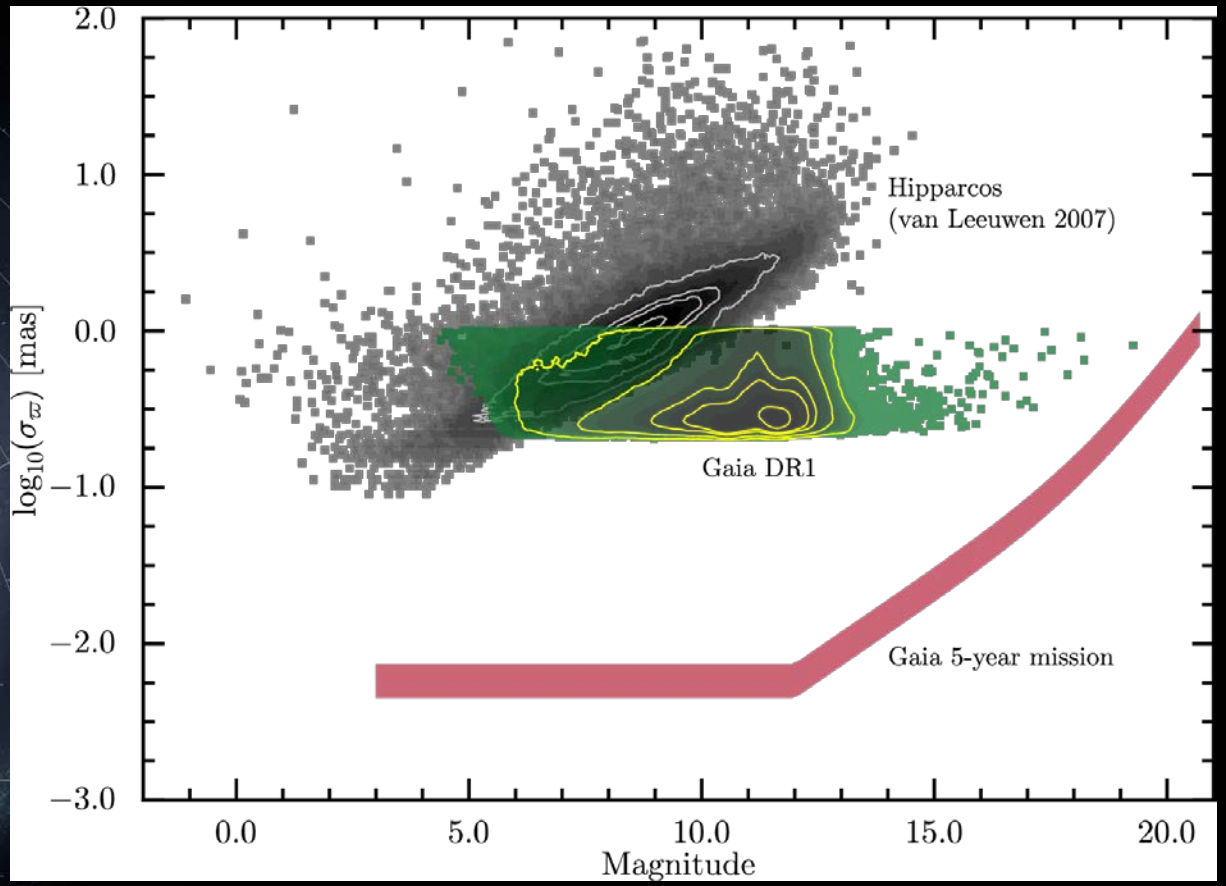
E. Serpell, ESOC; Airbus DS



Sky map based on Gaia housekeep data E. Serpell, ESOC

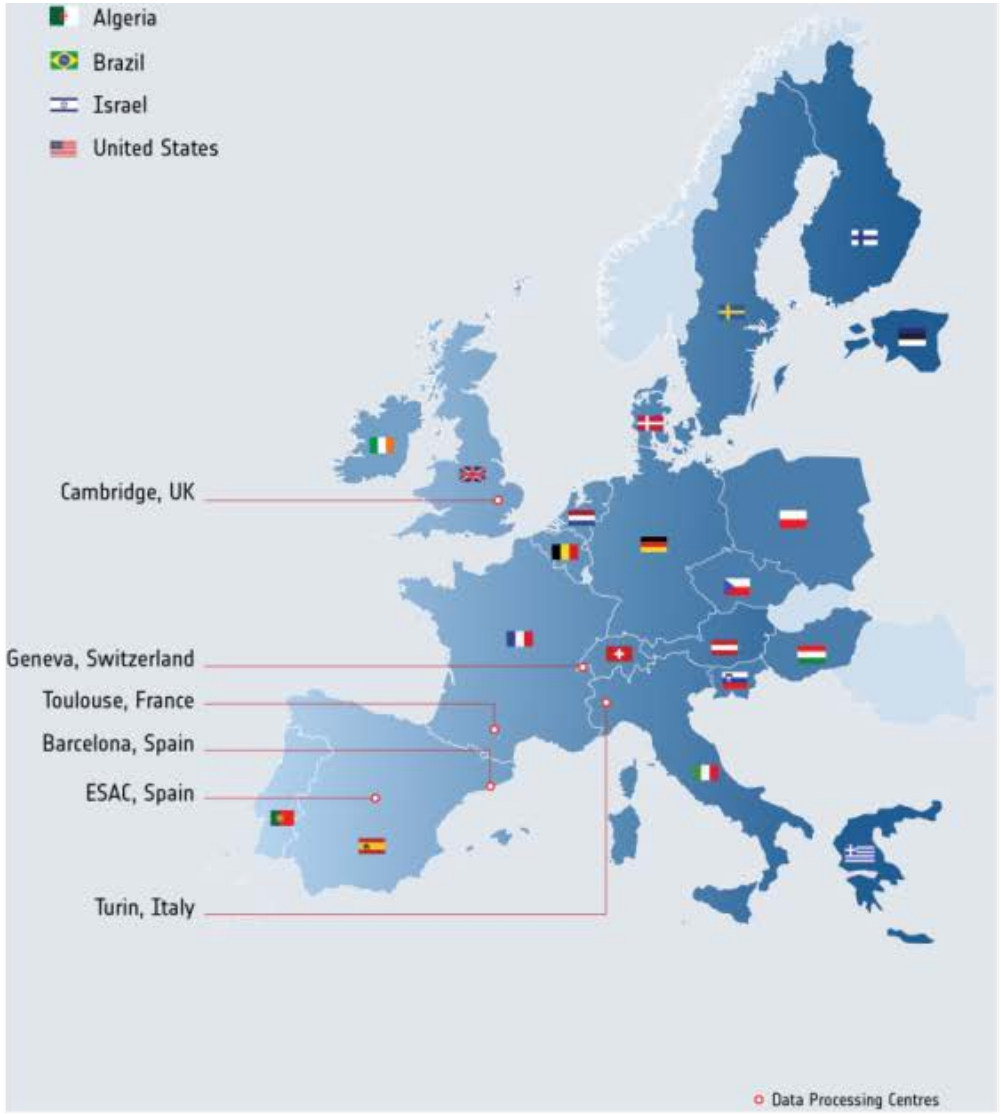
Gaia: building on the Hipparcos legacy





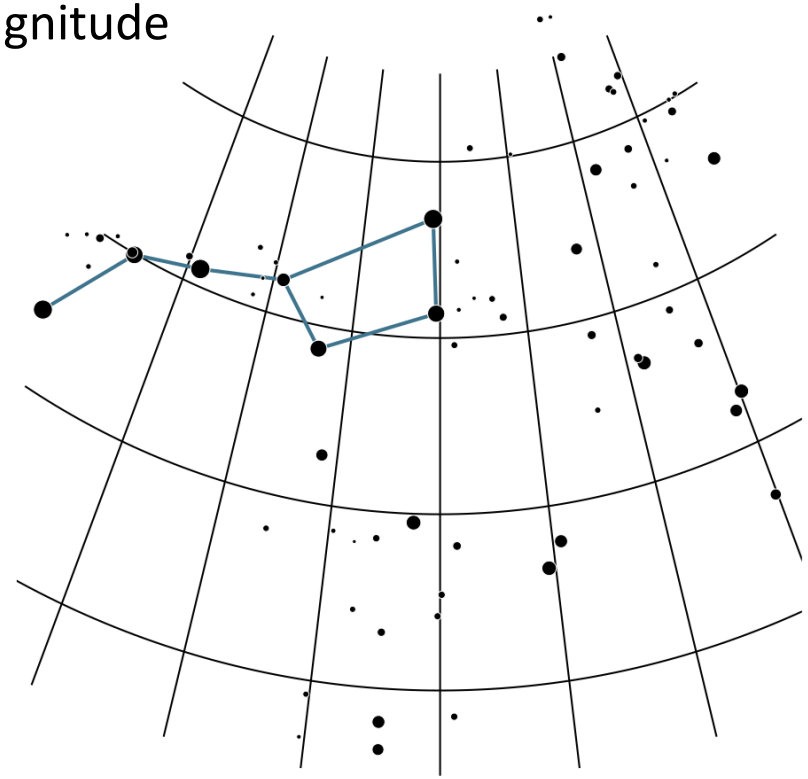
Teamwork for a billion stars

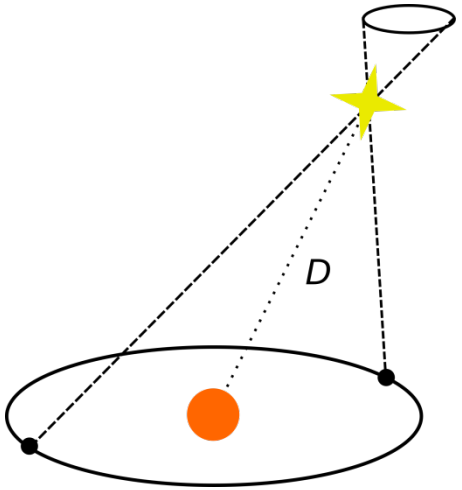
- 10+ years effort
- 450 scientists and engineers
- 160 institutes
- 24 countries and ESA
- 6 data processing centres



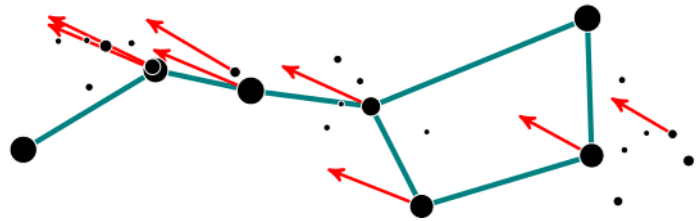
What's in Gaia DR1

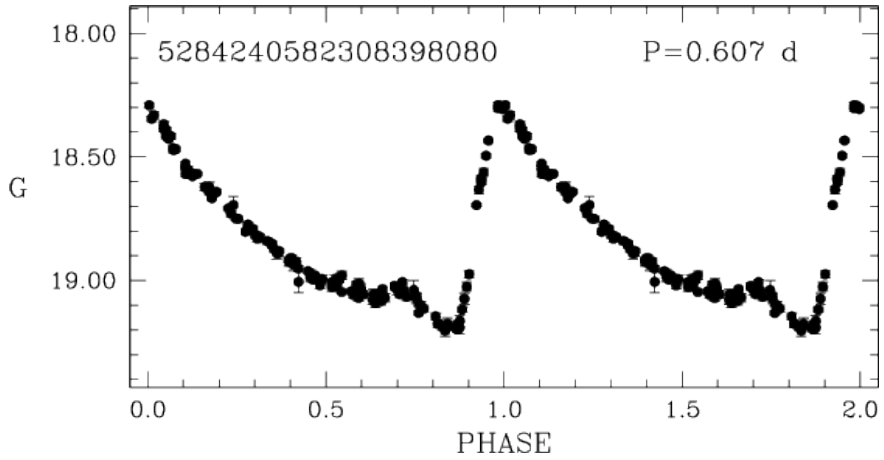
Billion star atlas to
20th magnitude



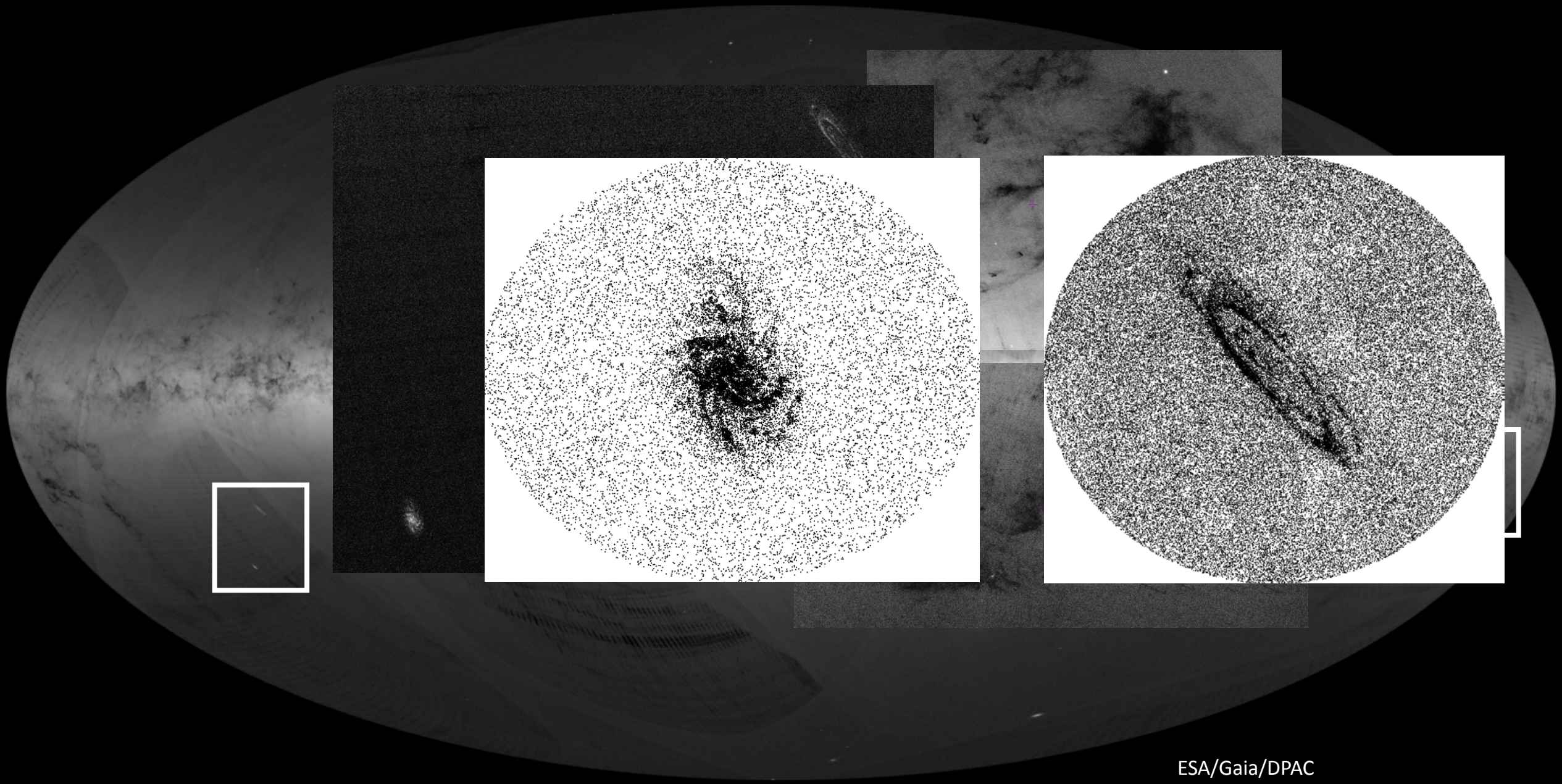


Tycho-Gaia astrometric solution
2 million parallaxes and proper motions
to 12th magnitude

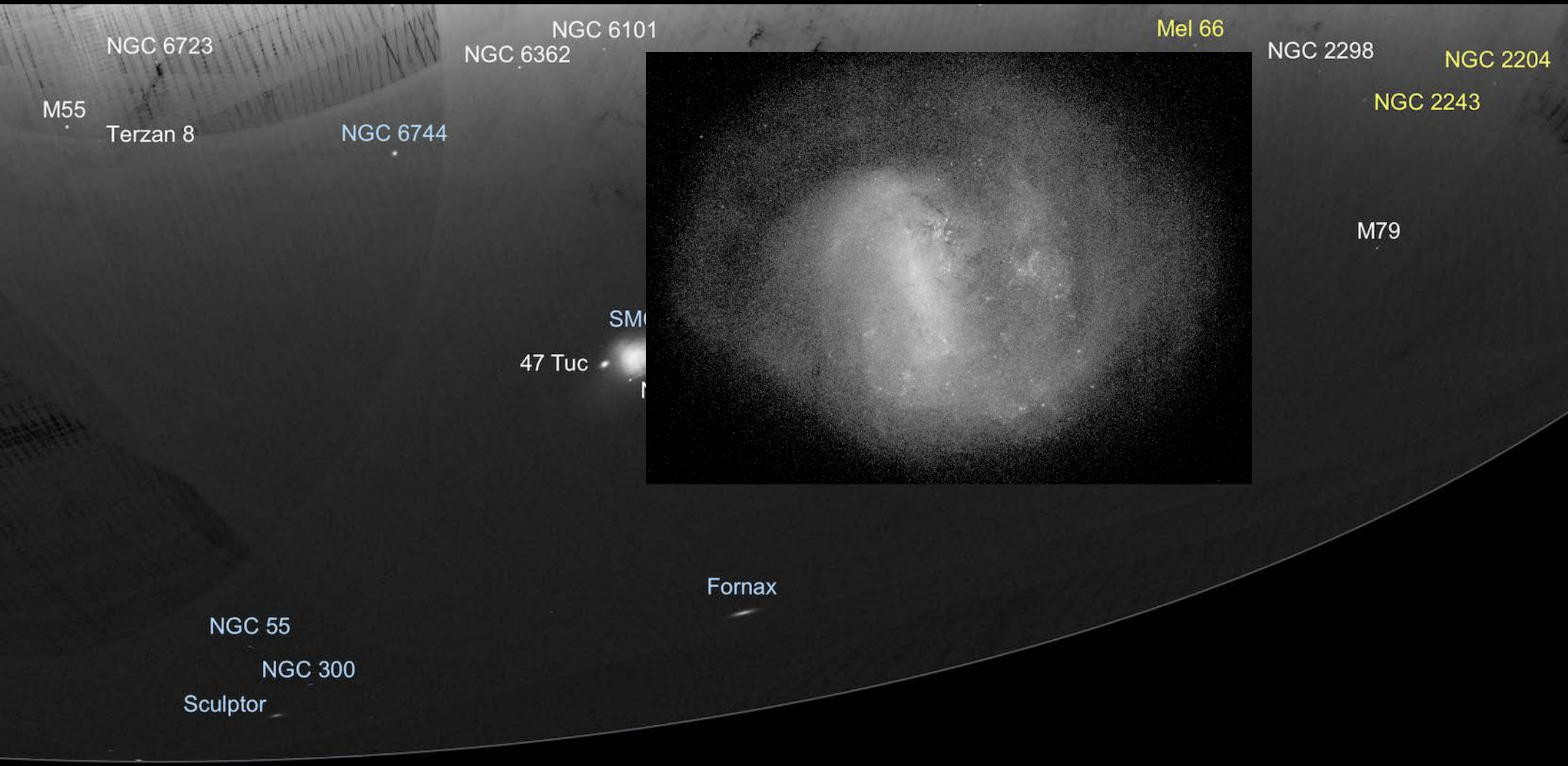




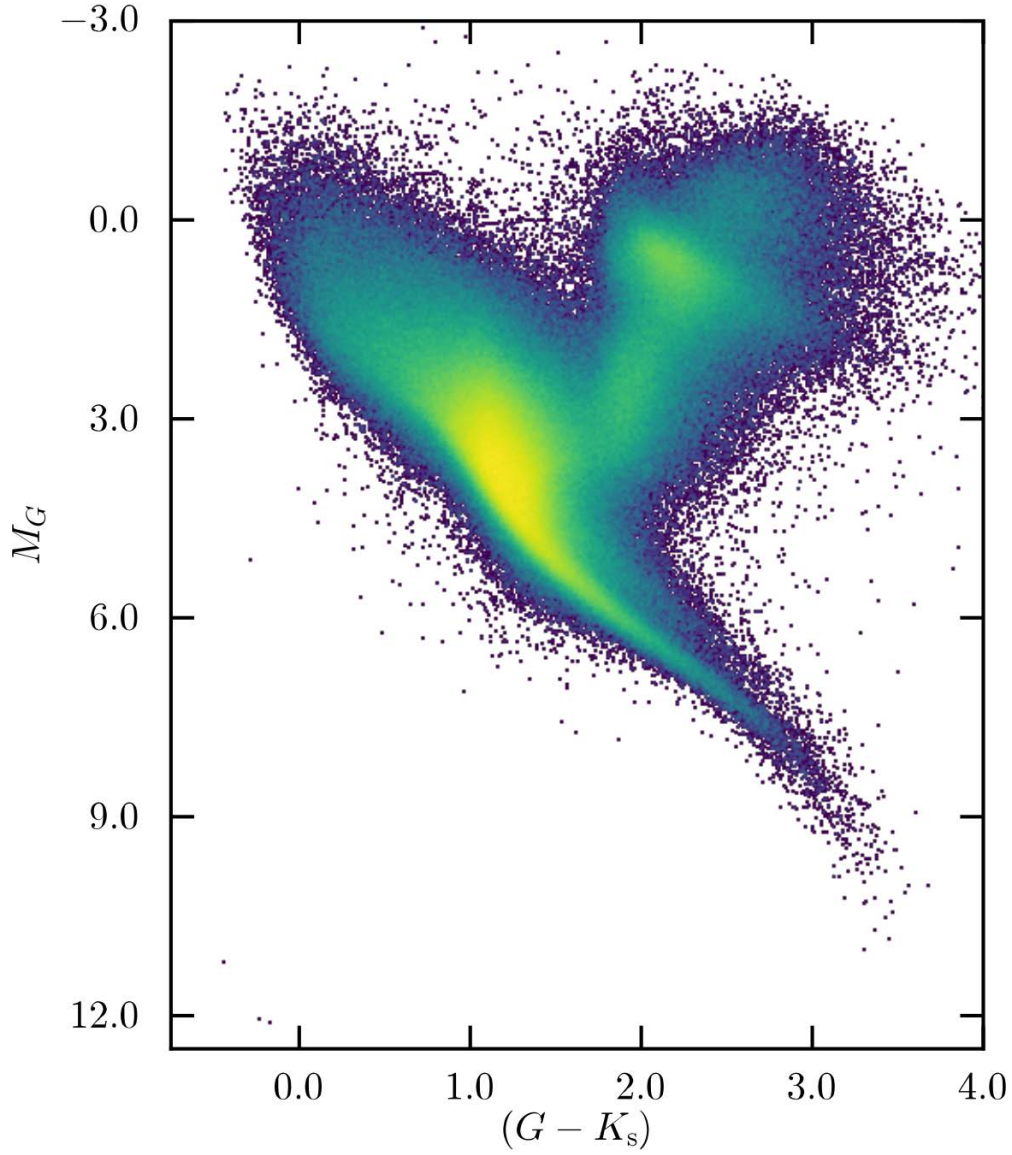
Variable star light curves
~3000

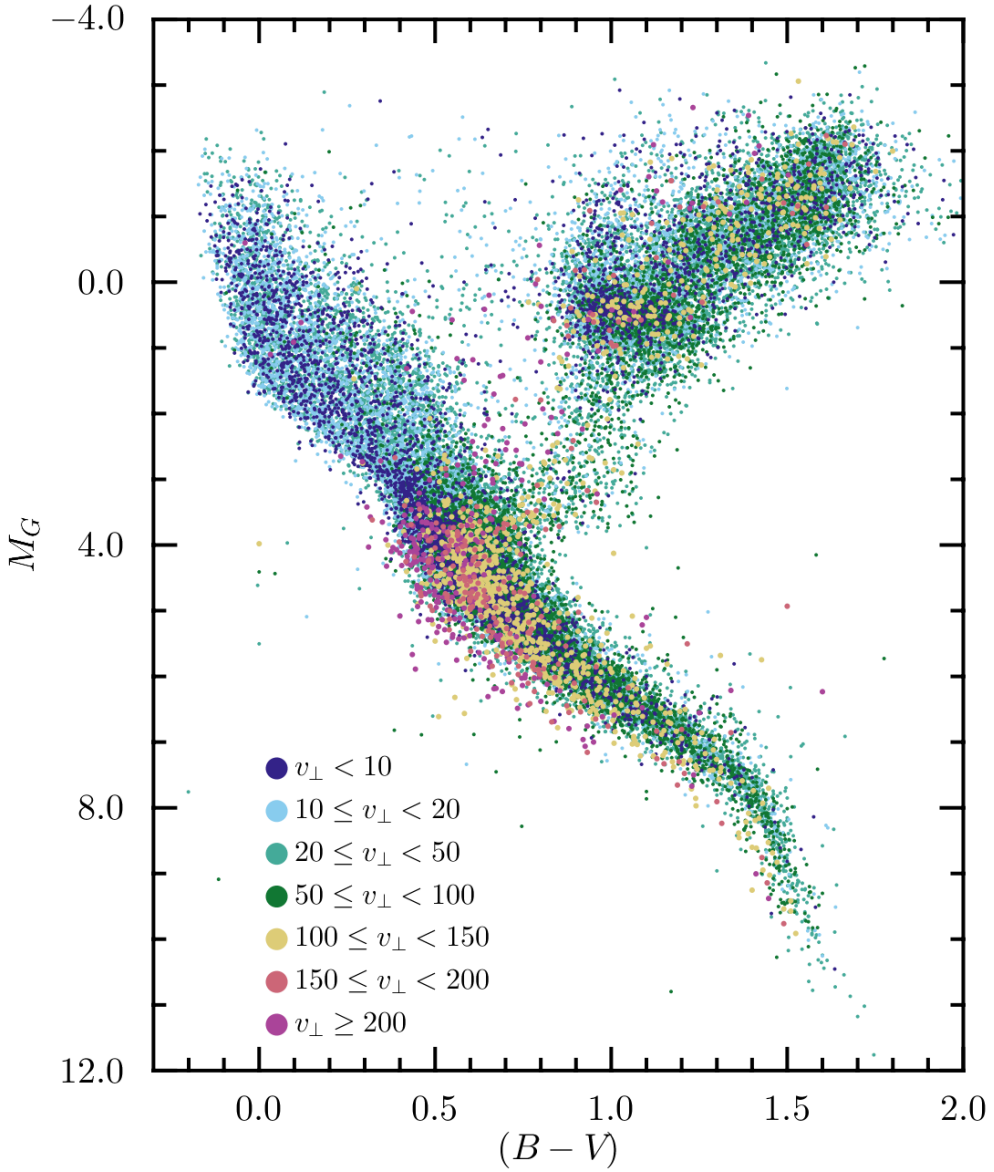


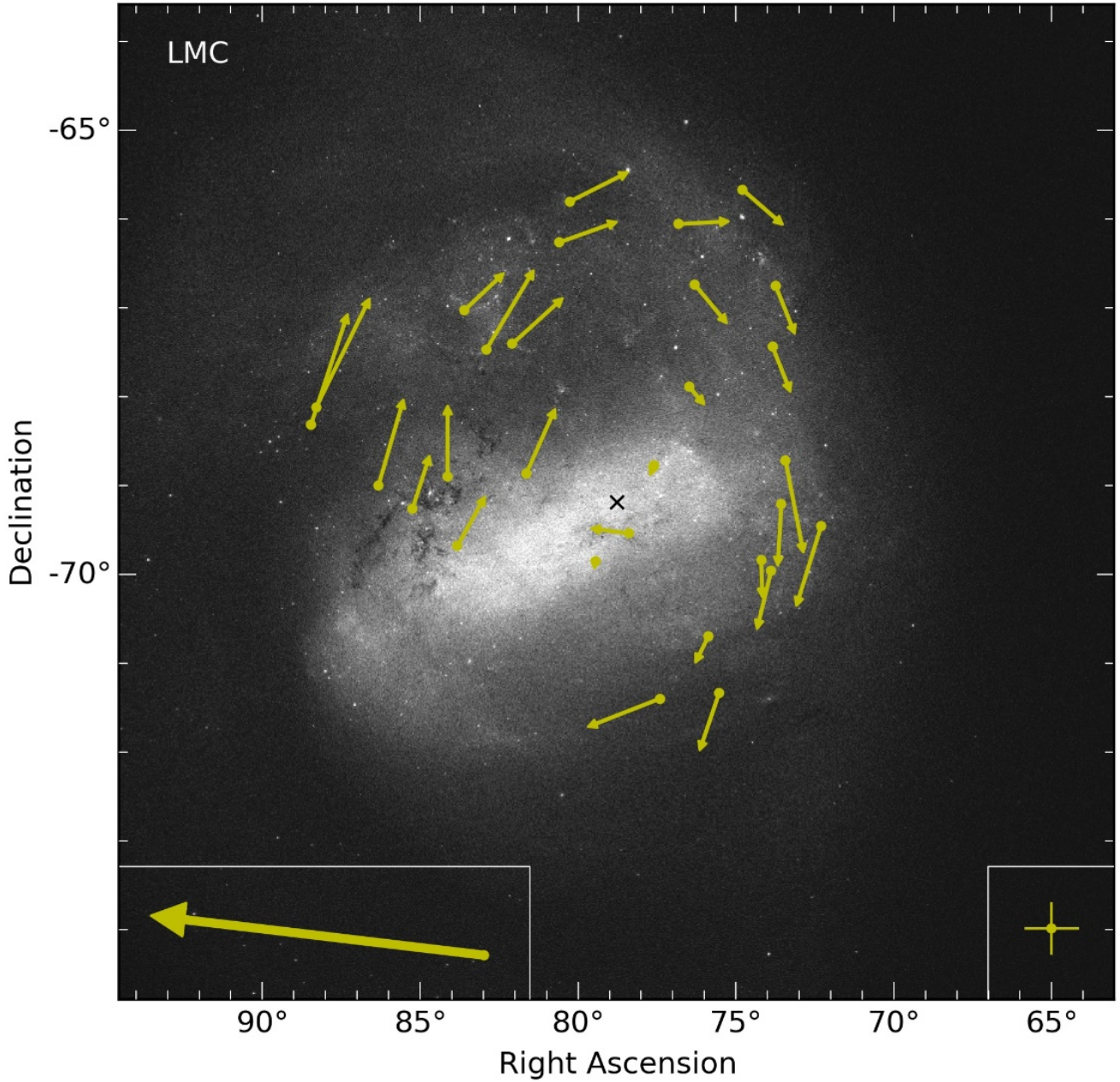
ESA/Gaia/DPAC


NGC 6723
NGC 6101
Mel 66
NGC 6362
NGC 2298
NGC 2204
M55
NGC 2243
Terzan 8
NGC 6744
M79
47 Tuc
Fornax
NGC 55
NGC 300
Sculptor

Galactic dynamics in the Hertzsprung Russell diagram

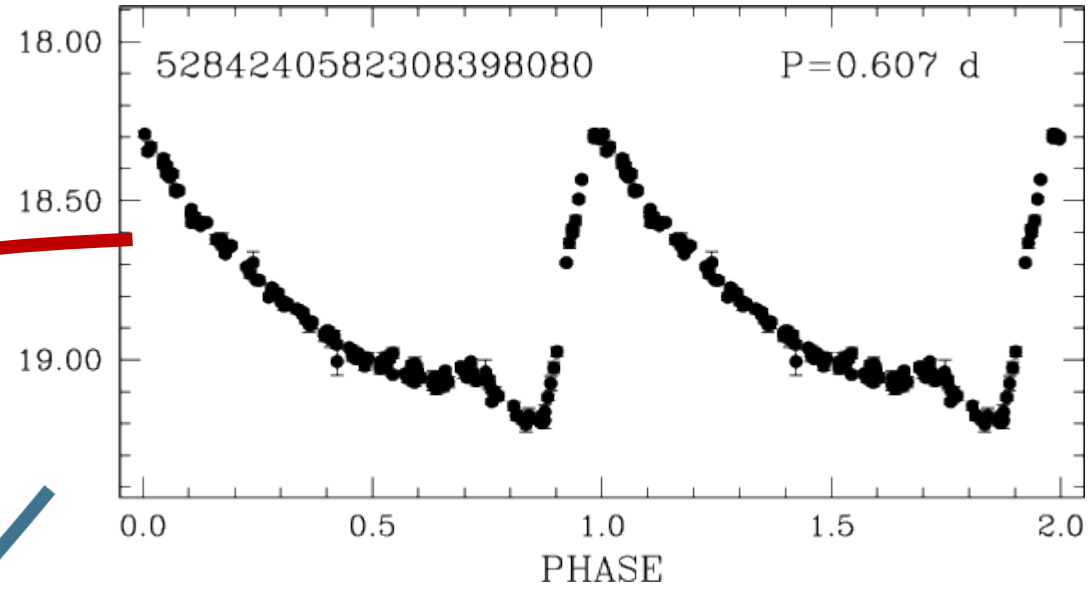


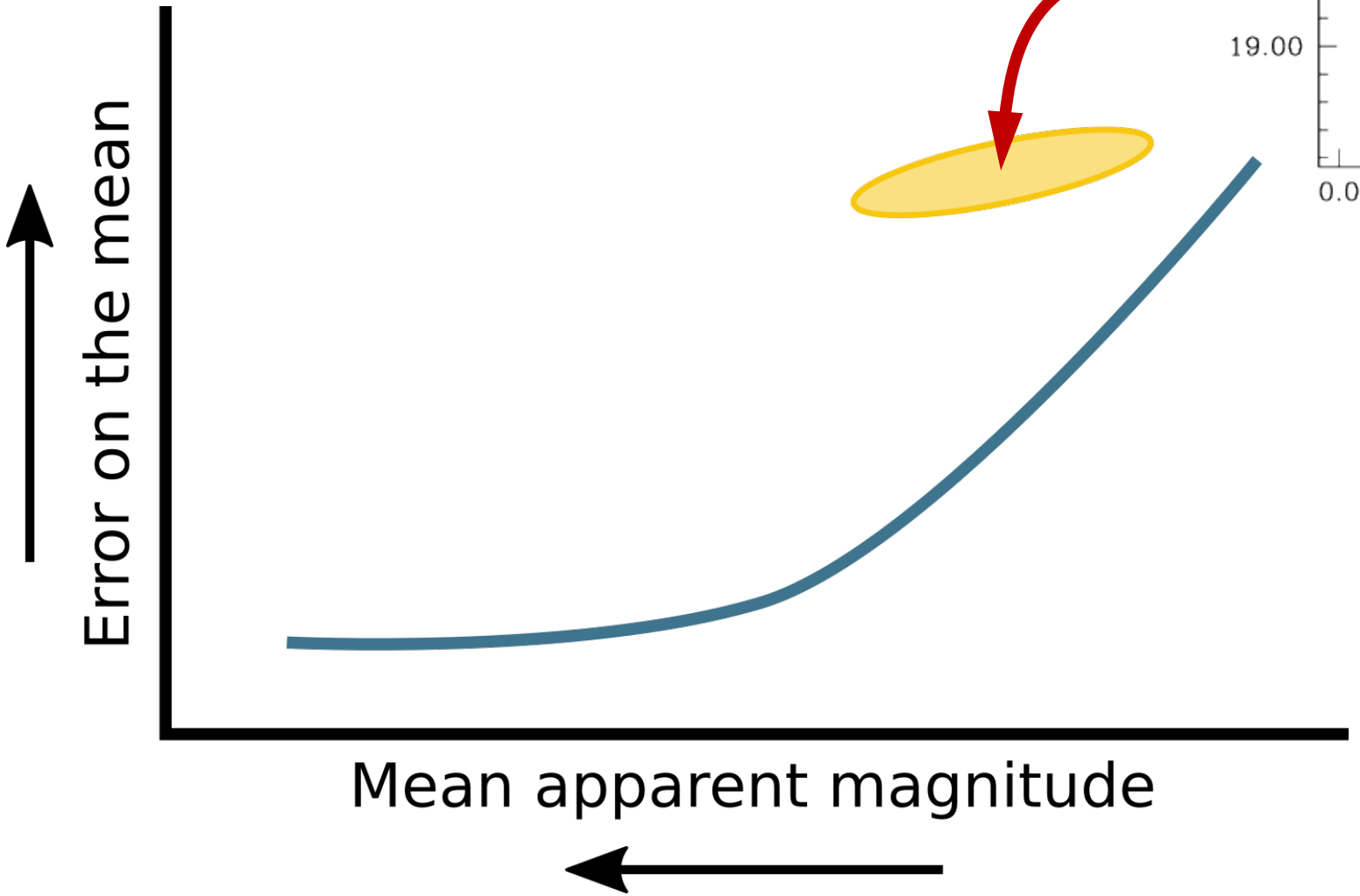




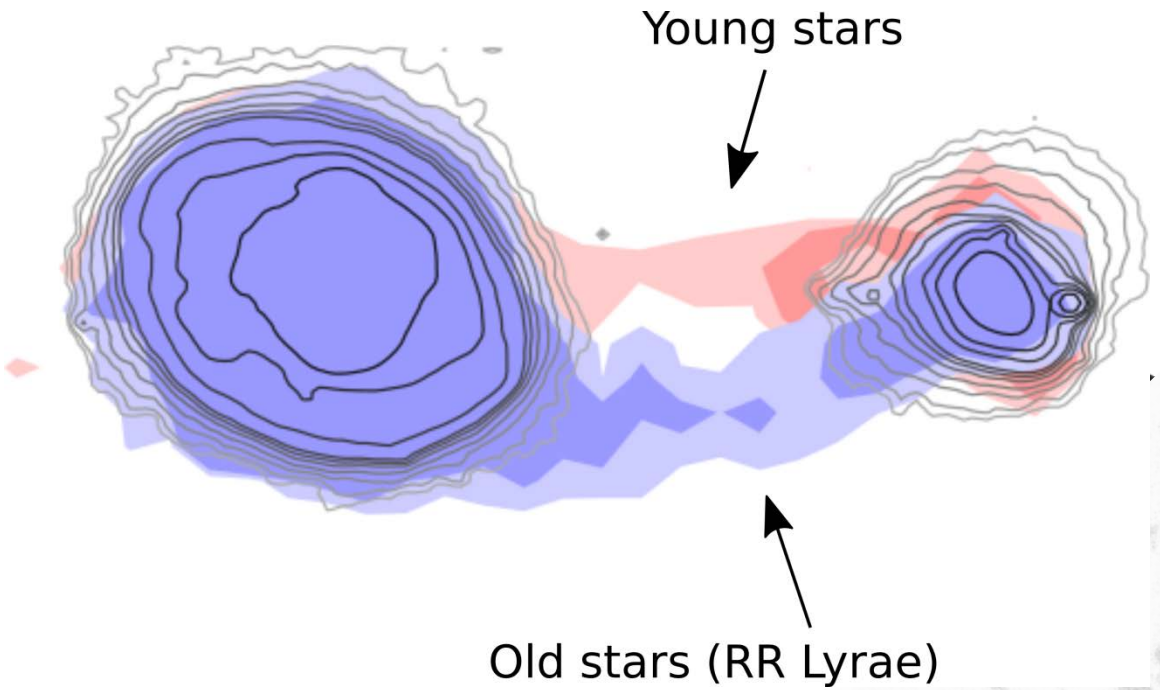
R. van der Marel & J. Sahlmann (2016)

Magellanic Clouds structure



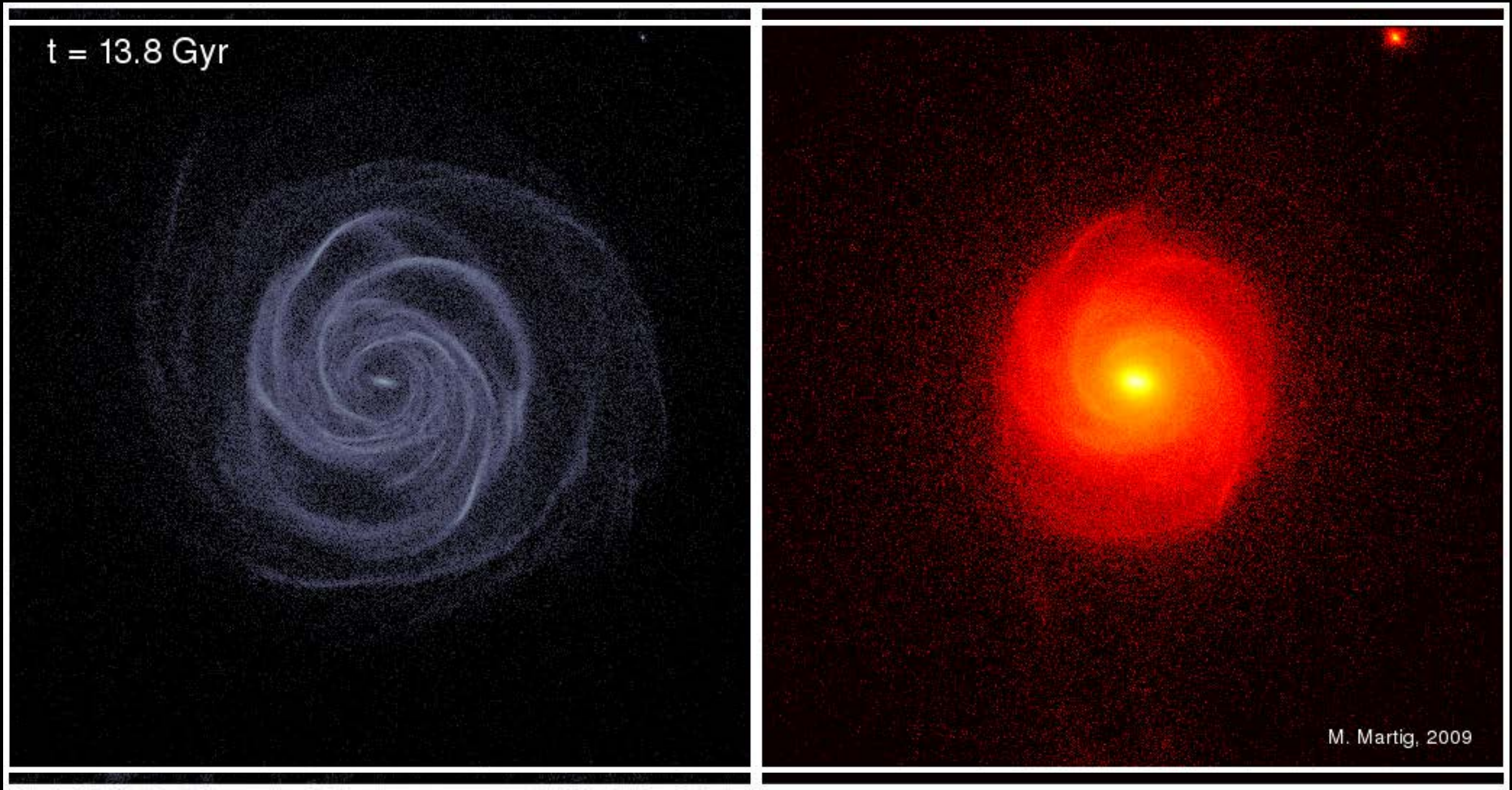


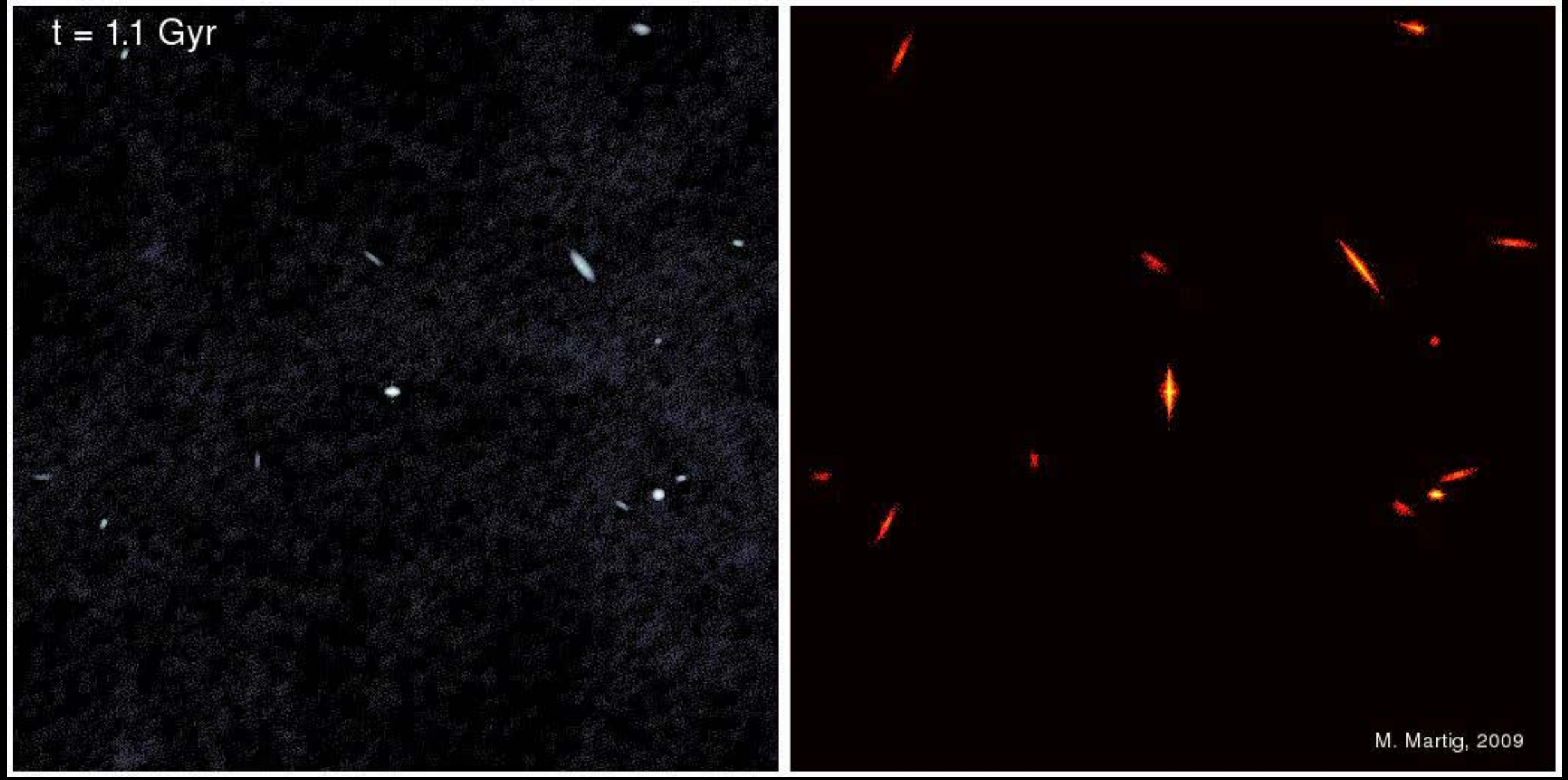
Magellanic Clouds Structure



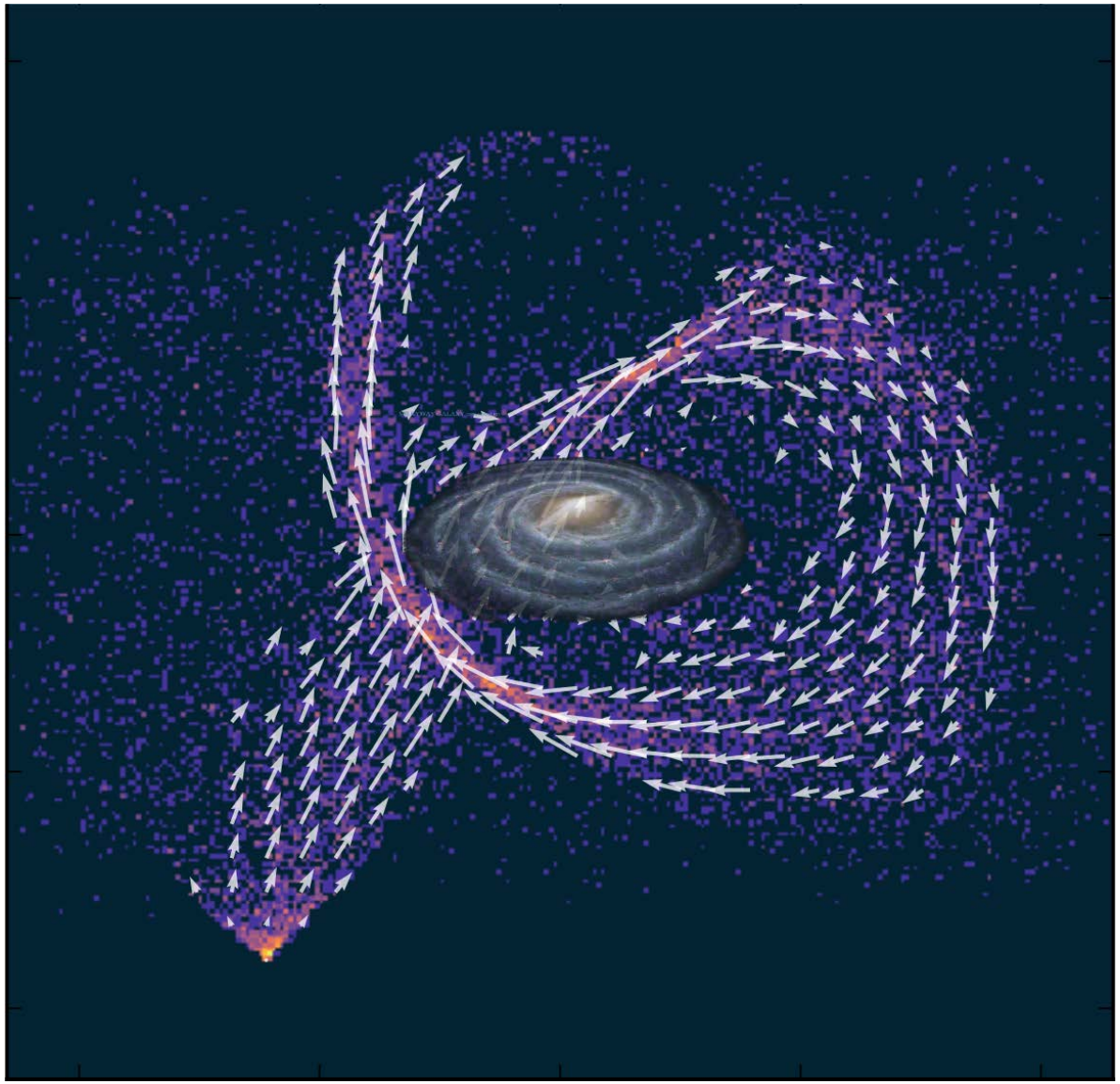
Belokurov et al (2016)

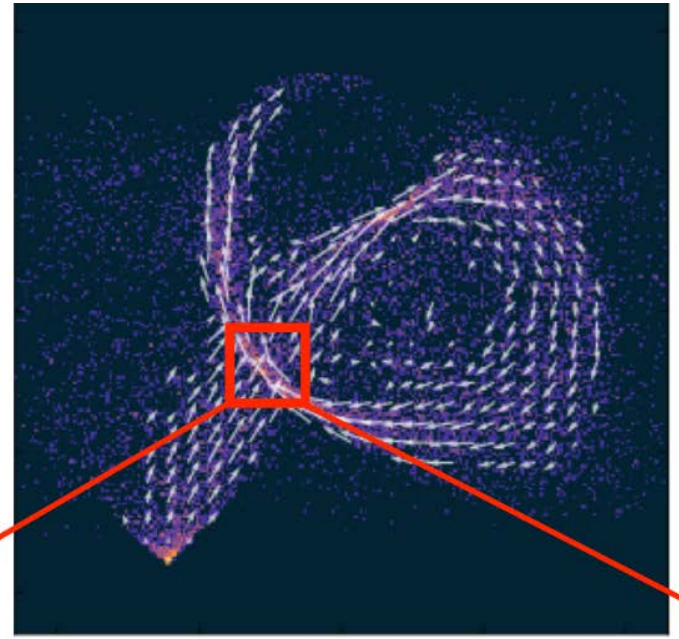
Putman et al (2003)

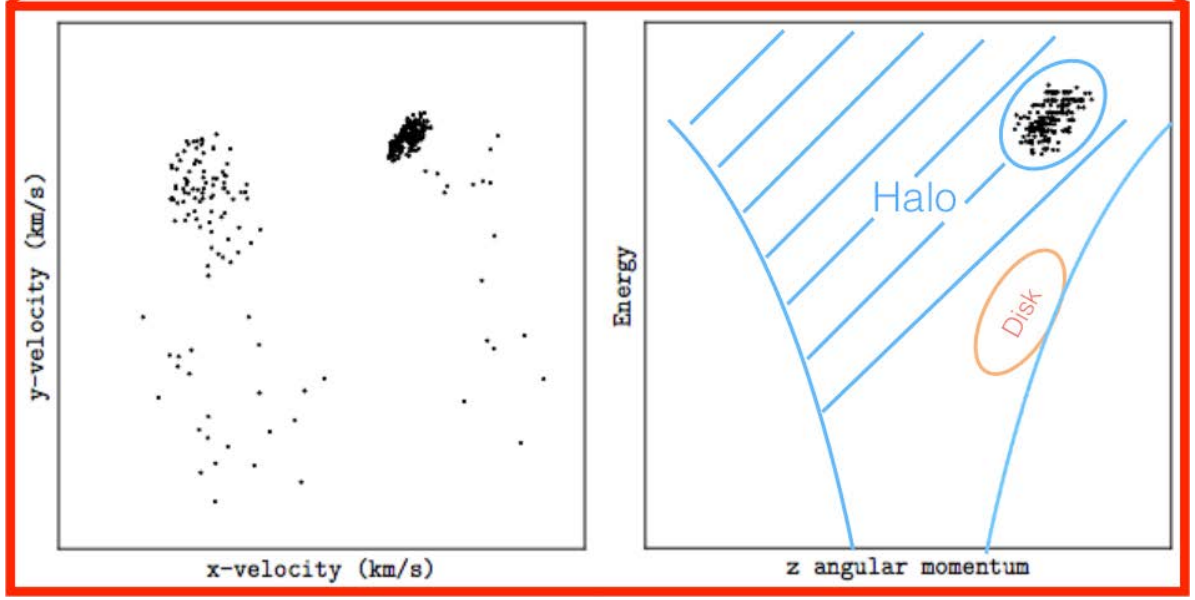

t = 13.8 Gyr
M. Martig, 2009


t = 1.1 Gyr
M. Martig, 2009

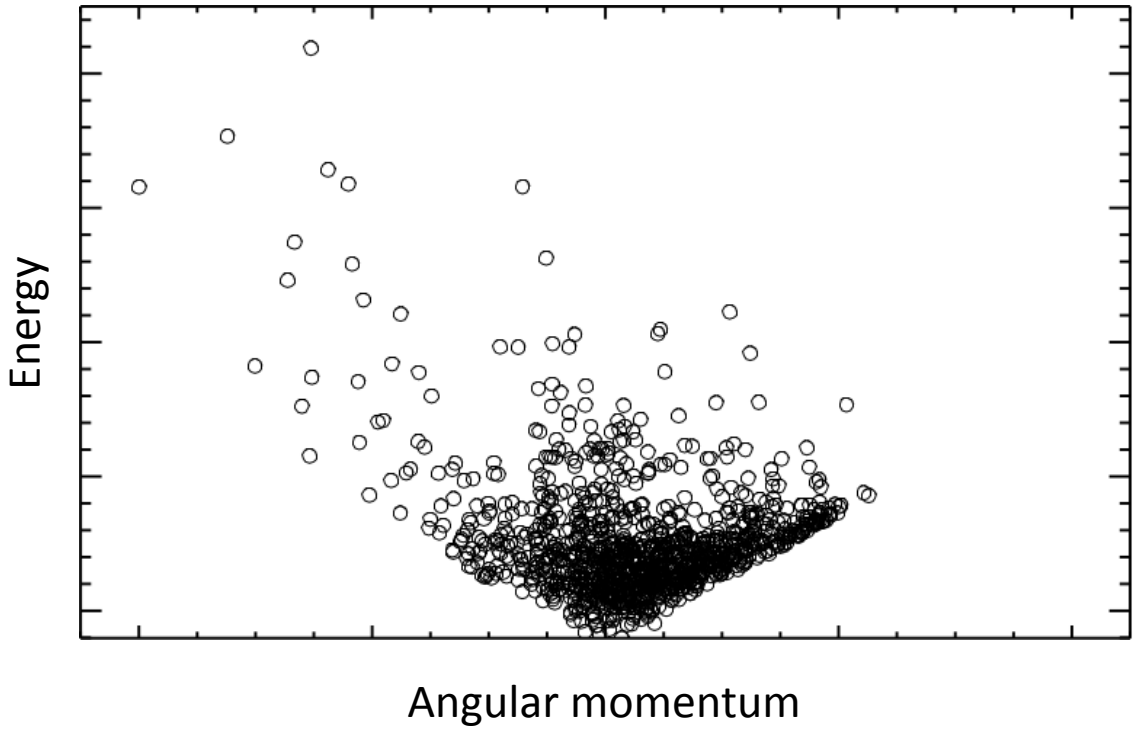
A box full of chocolates



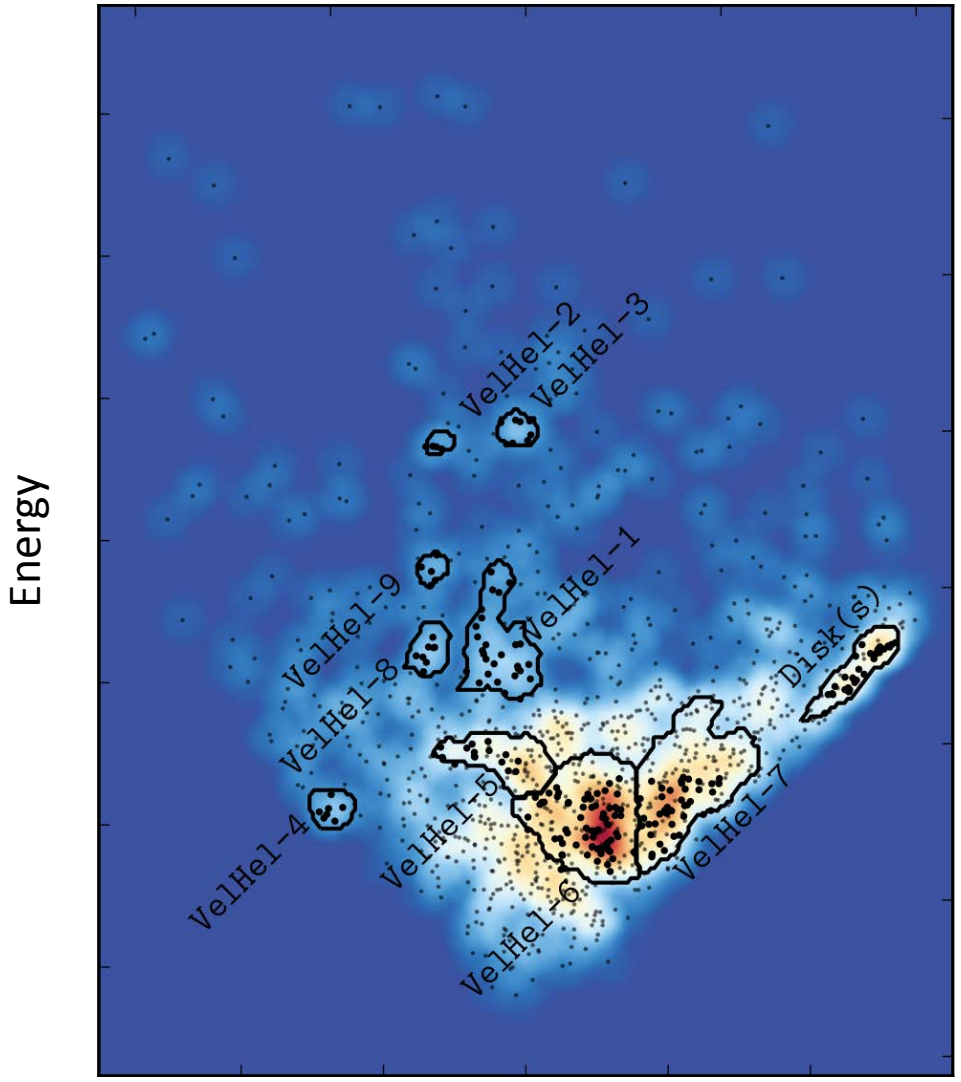




A box full of chocolates

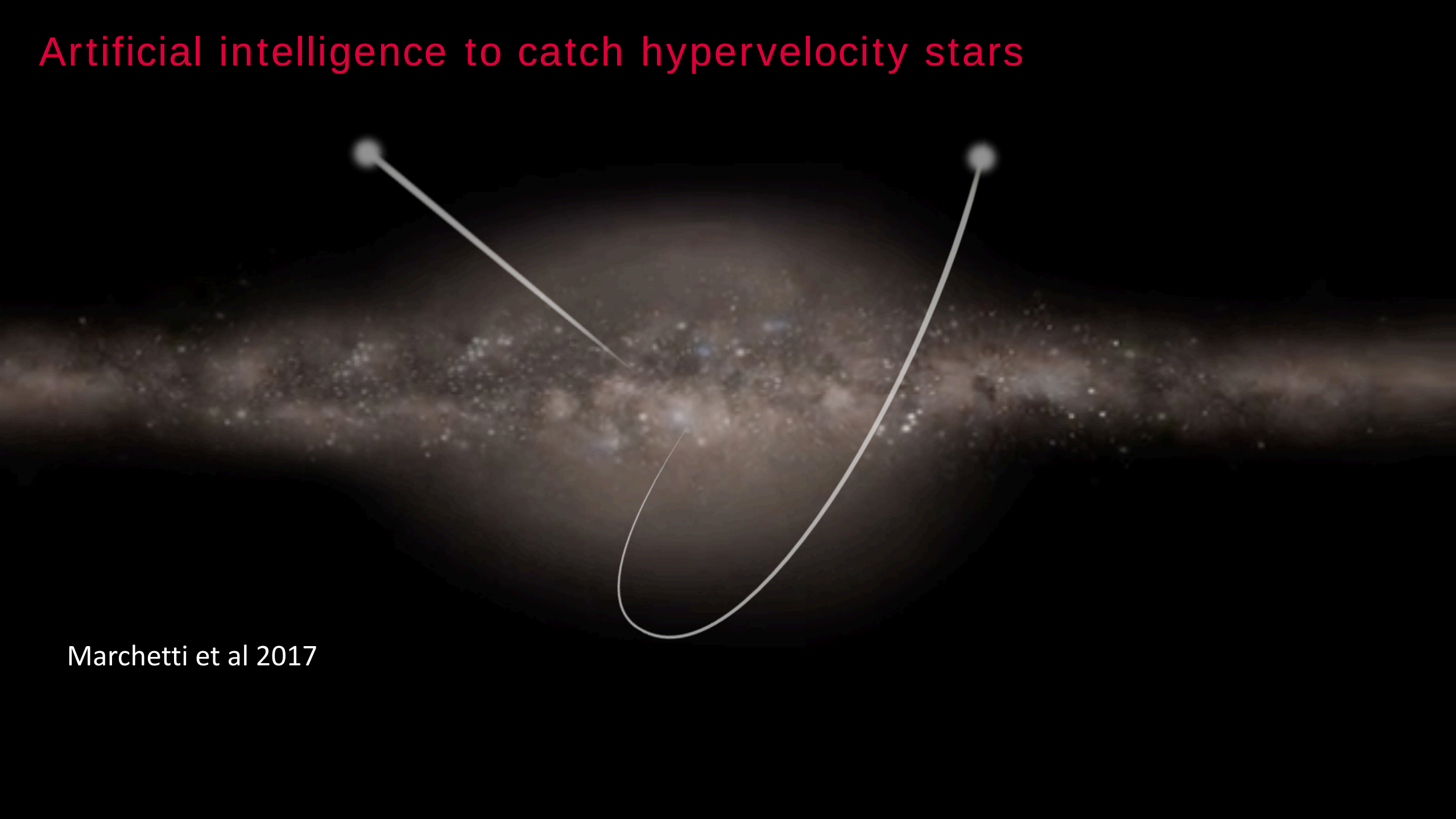


Helmi et al 2016



Simulation: A. Helmi

Artificial intelligence to catch hypervelocity stars



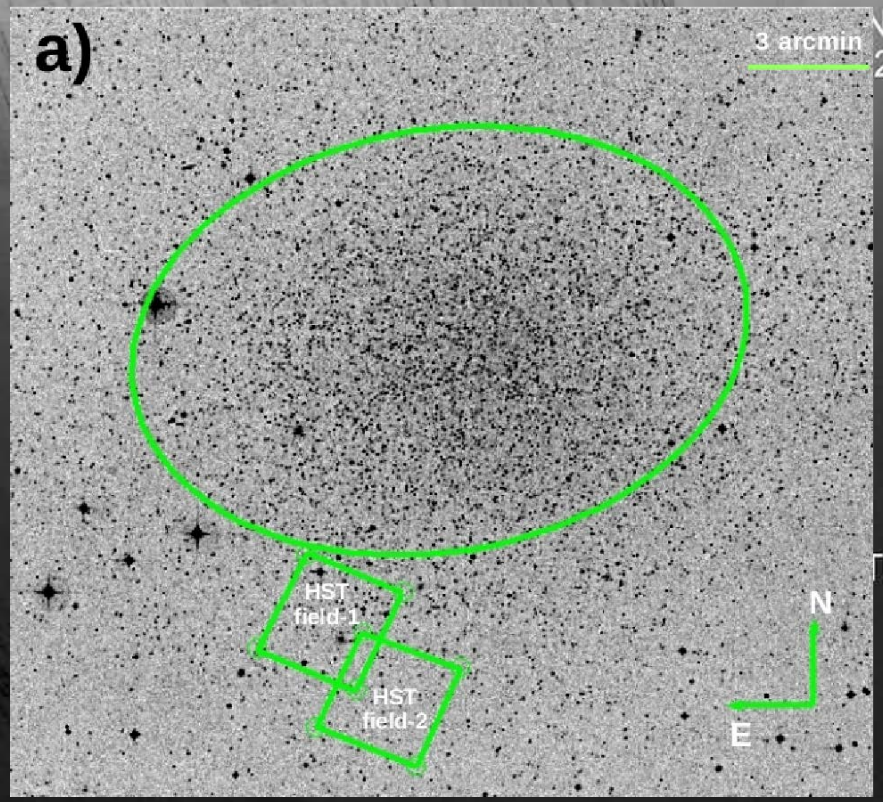
Marchetti et al 2017

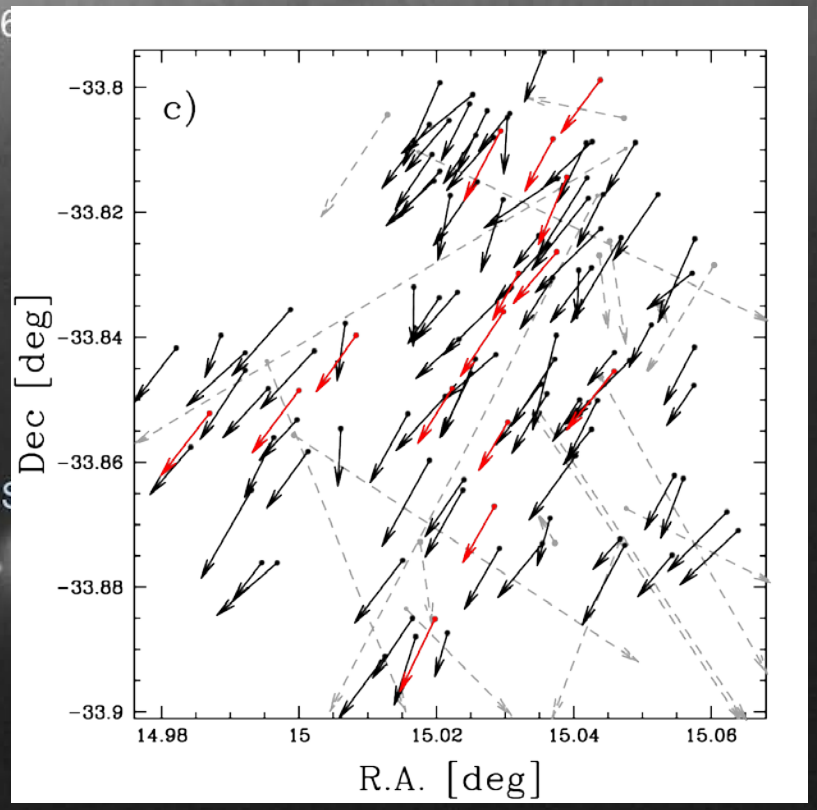
gaia

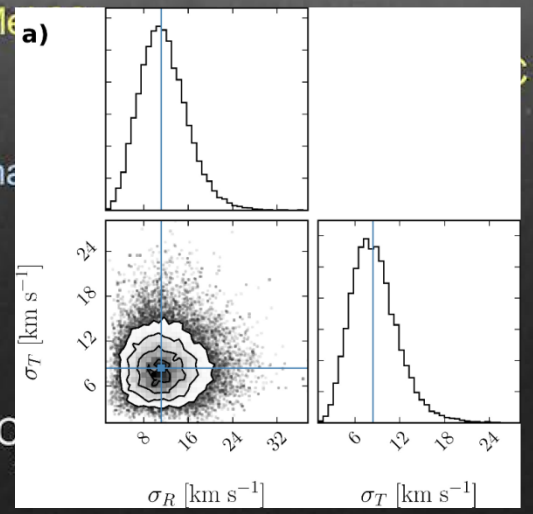
gaia

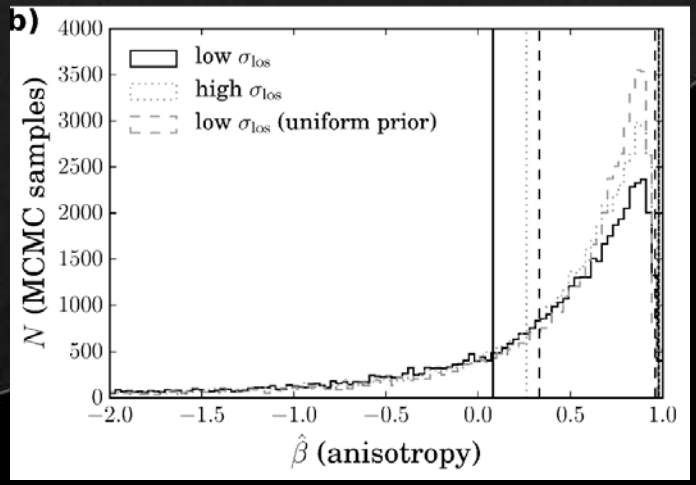
→ CATCHING SPEEDING STARS

Stellar motions in the Sculptor dwarf: Gaia DR1 + HST









NGC 55

NGC 300

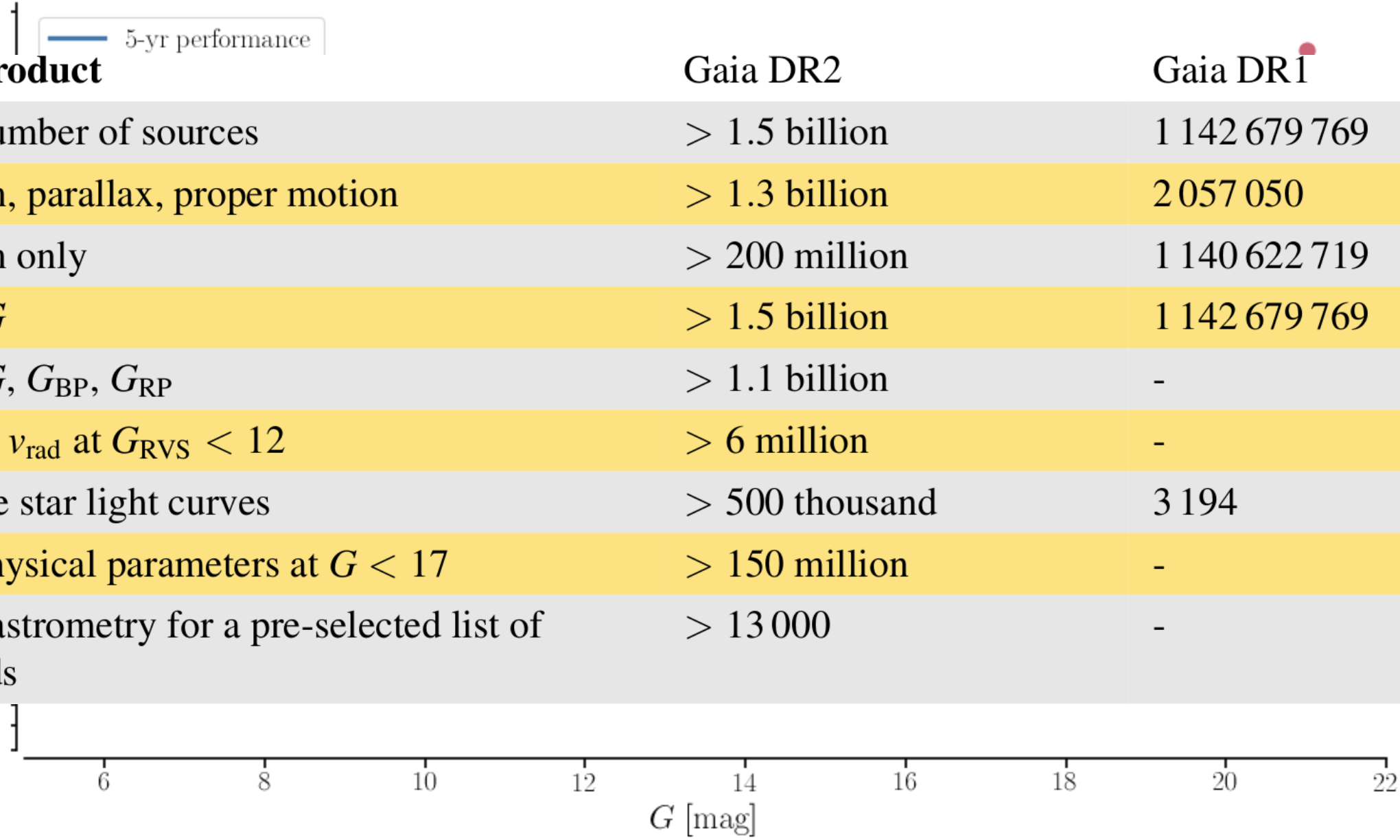
Sculptor

Fornax

Massari et al. 2018

April 25: a big step from Gaia DR1 to Gaia DR2

Data product	Gaia DR2	Gaia DR1
Total number of sources	> 1.5 billion	1 142 679 769
Position, parallax, proper motion	> 1.3 billion	2 057 050
Position only	> 200 million	1 140 622 719
Mean G	> 1.5 billion	1 142 679 769
Mean G, G_{BP}, G_{RP}	> 1.1 billion	-
Median v_{rad} at $G_{RVS} < 12$	> 6 million	-
Variable star light curves	> 500 thousand	3 194
Astrophysical parameters at $G < 17$	> 150 million	-
Epoch astrometry for a pre-selected list of asteroids	> 13 000	-

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