Observational Hertzsprung-Russell diagrams

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based on Gaia Collaboration, Babusiaux et al, arXiv:1804.09378
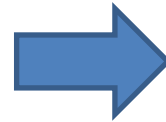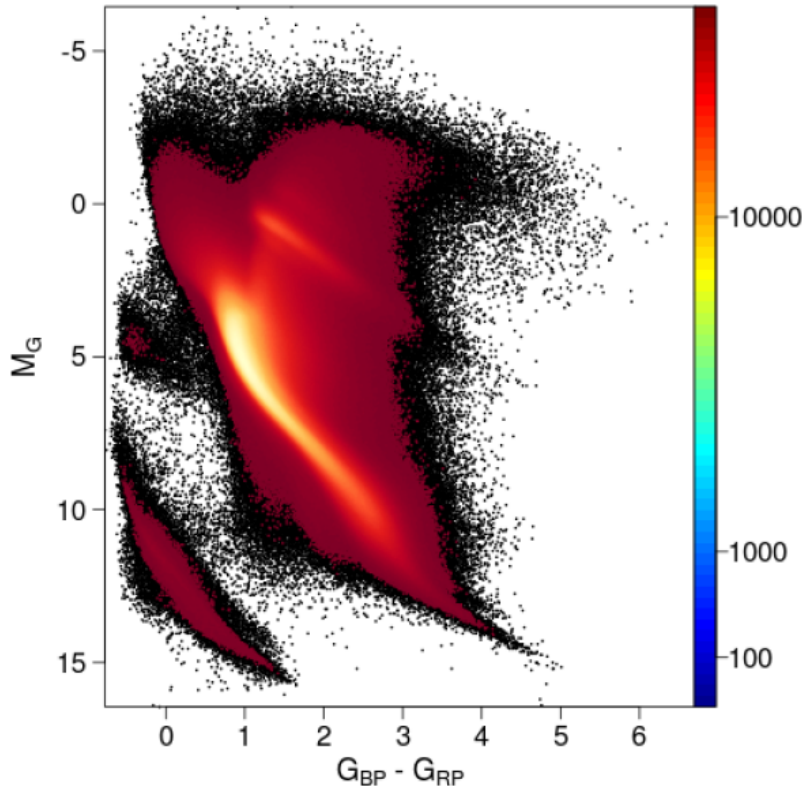
Credits: ESA/Gaia/DPAC

REG, 28 May 2018
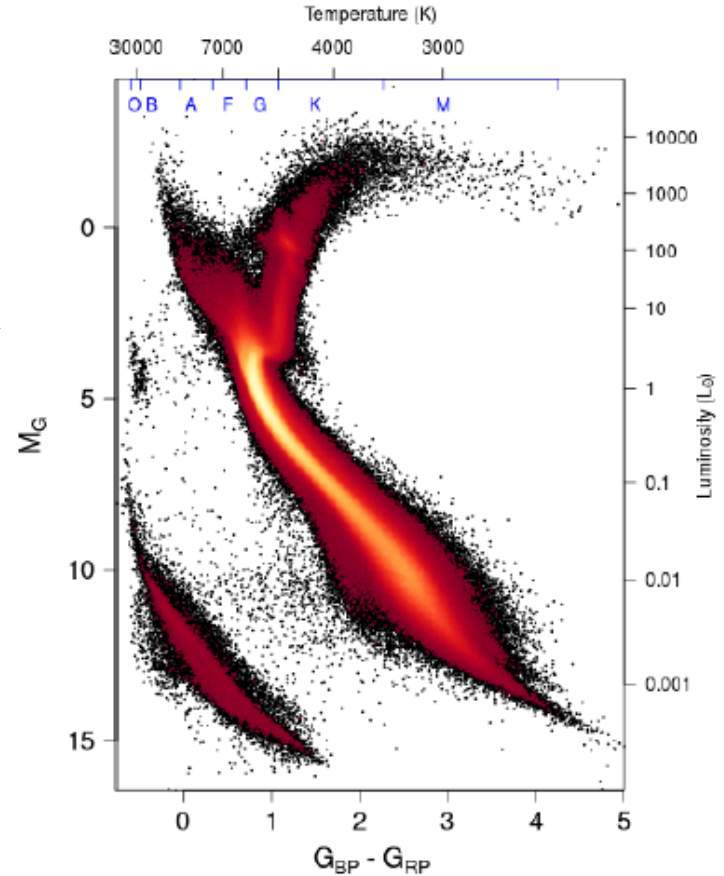
HR diagram

~ 66·10^6 stars with 10% relative error in parallax + other filters

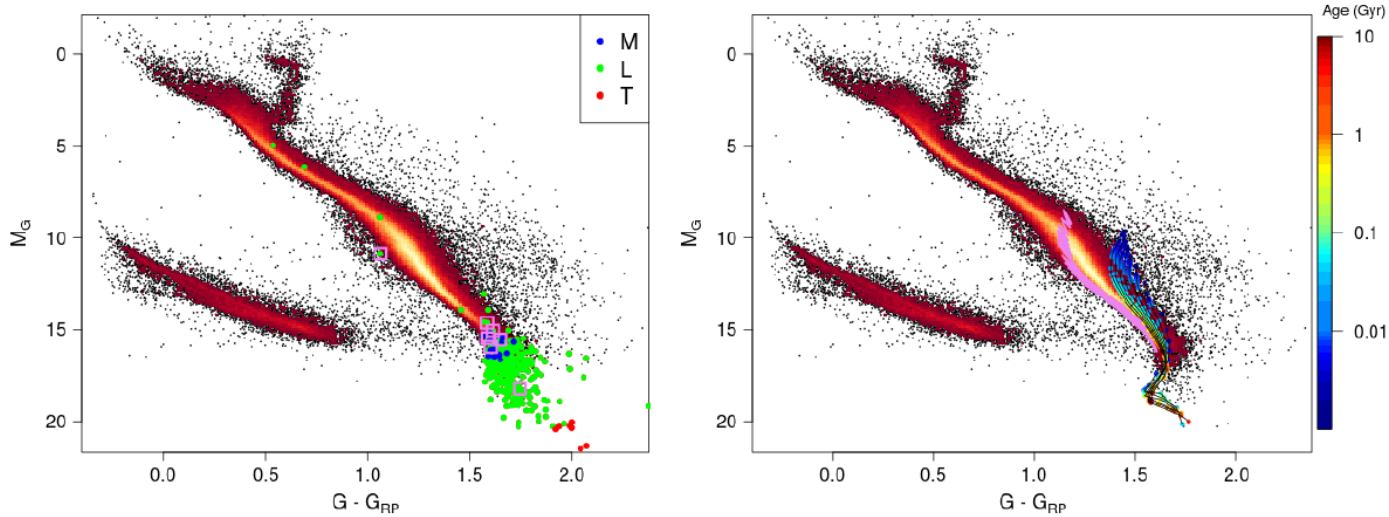~ 4.3·10^6 stars with E(B-V)<0.015

Solar neighbourhood

$\varpi > 40$ mas
(25 pc, ...

$\varpi > 10$ mas
(100 pc, 212,728 stars)
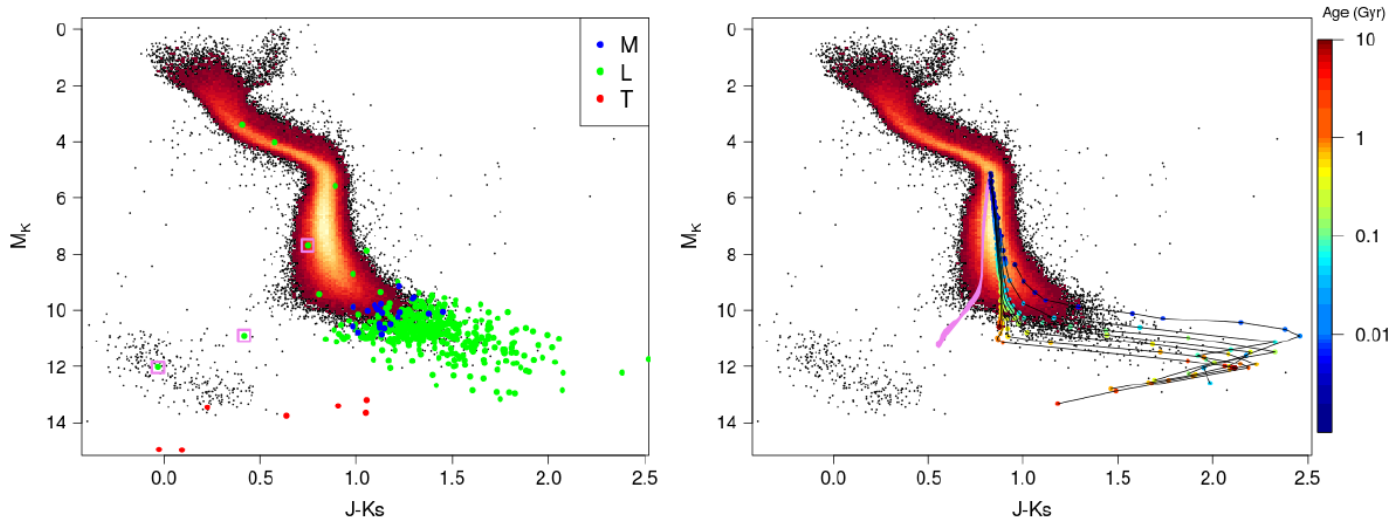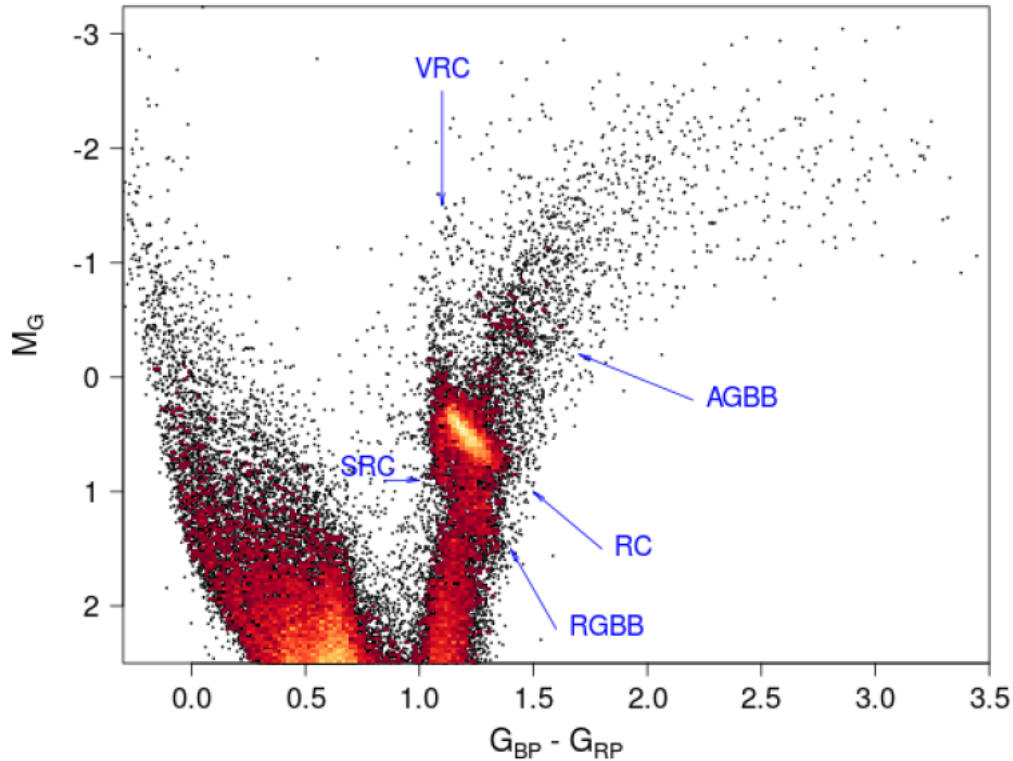
Low mass objects

Some with
$v_T > 200$ km/s

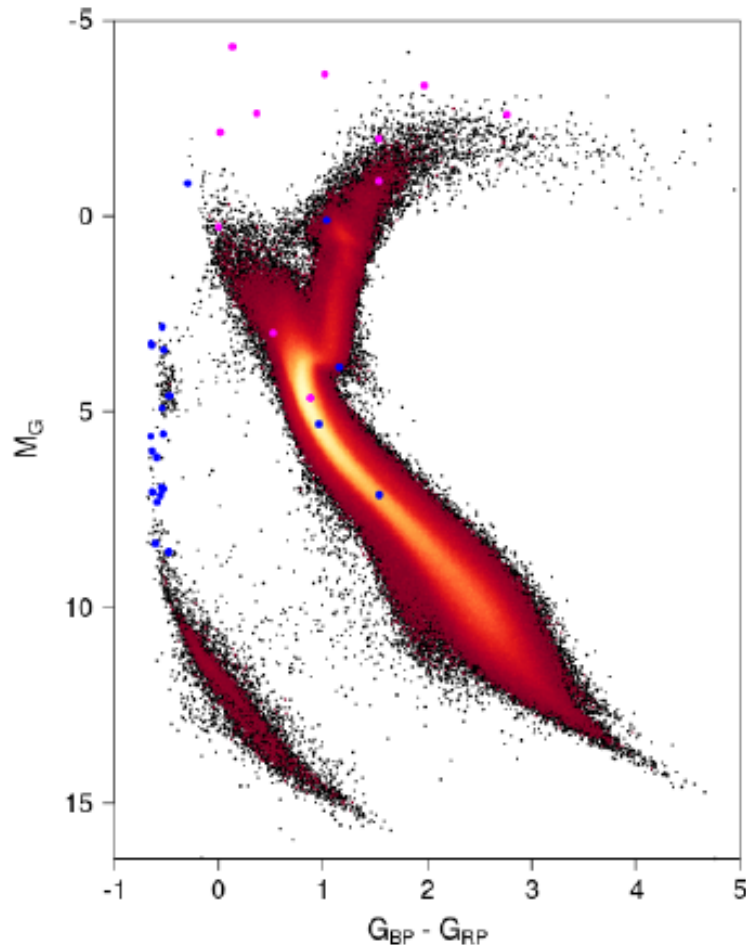BT-Settl tracks
(Baraffe et al.
2015)

Gaia ultracool dwarf sample (Smart et al. 2017)

Red clump stars

Low-extinction nearby giants:
$\varpi > 2$ mas (500 pc)
$E(B-V) < 0.015$
$M_G < 2.5$ (29,288 stars)
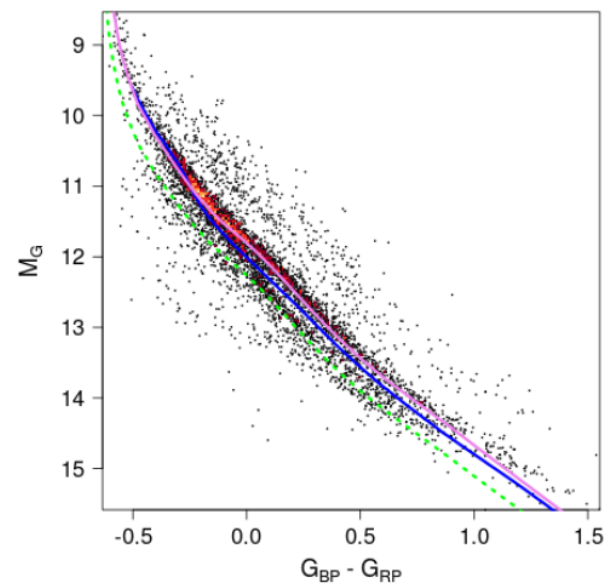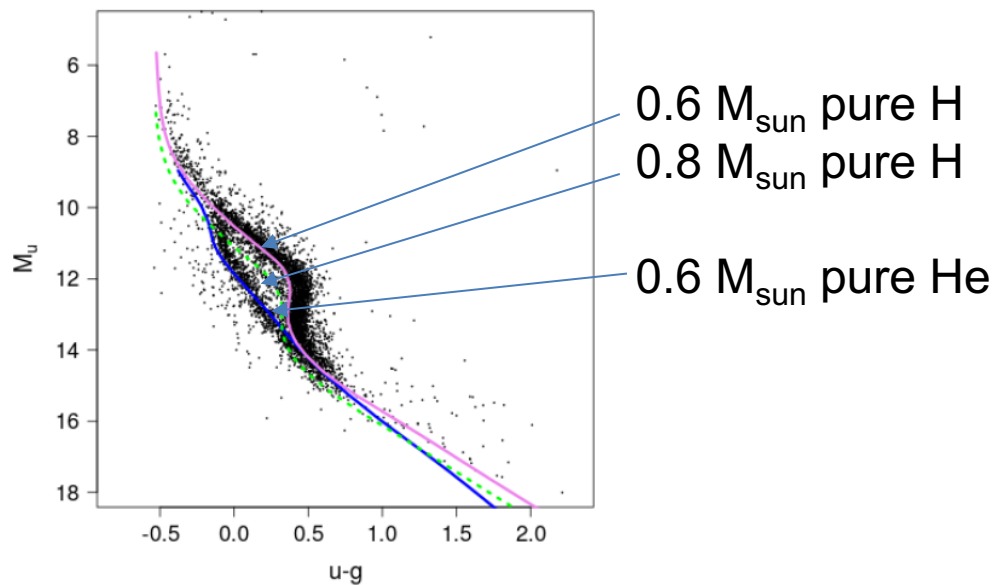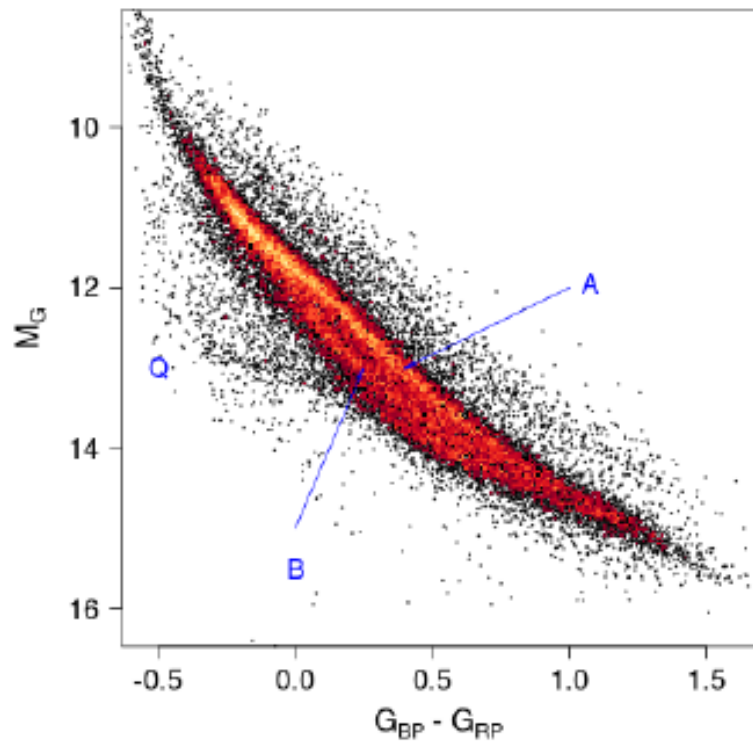
Planetary nebulae

Blue: 23 planetary nebulae from Kerber et al. (2003) 23 stars.

Magenta: 11 post-AGB stars from Szczerba et al. (2007)

White dwarfs

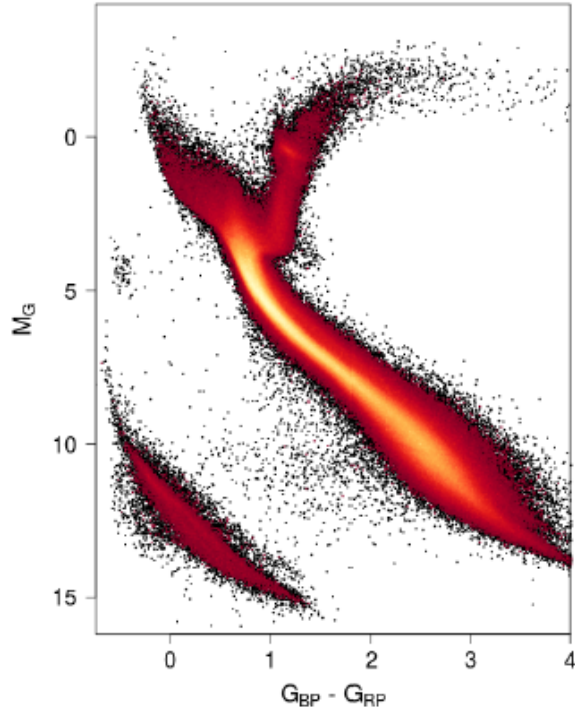Relative parallax error < 5%
(26,264 stars)

0.6 M$_{sun}$ pure H
0.8 M$_{sun}$ pure H

0.6 M$_{sun}$ pure He

Kilic et al (2018): fraction of mergers
El-Brady et al (2018): IMFR
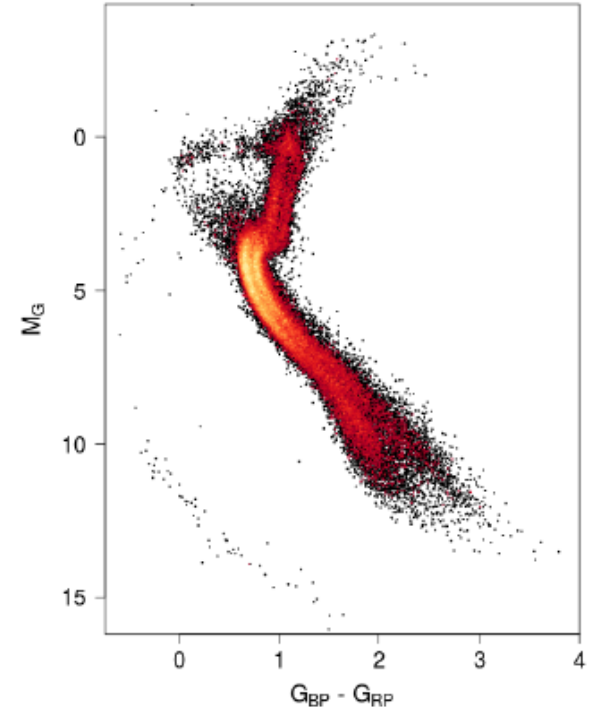Pelisoli et al (2018): ELM

Stellar populations

Thin disc — Thick disc — Halo

$V_T < 40$ km/s
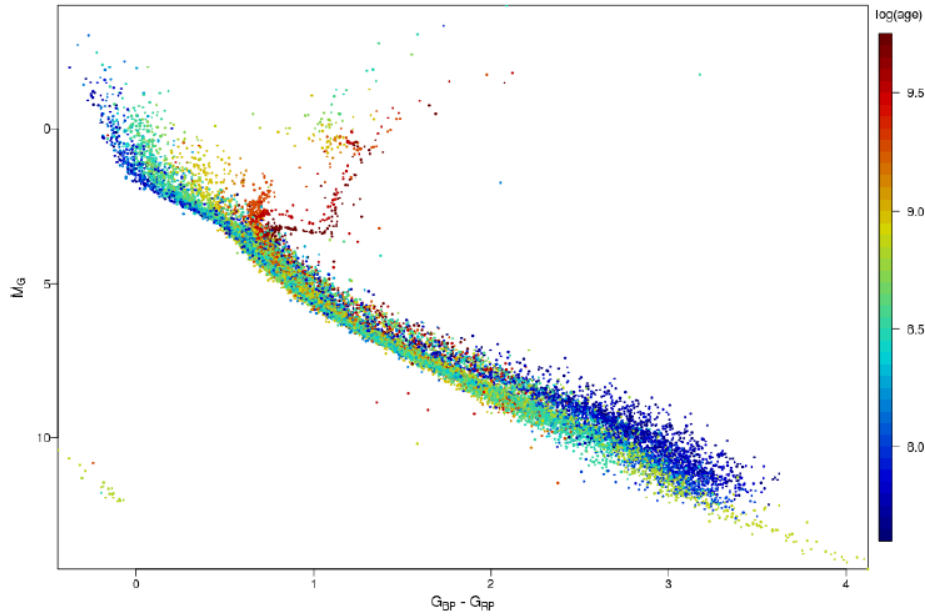(1,893,677 stars)

$60 < V_T < 150$ km/s
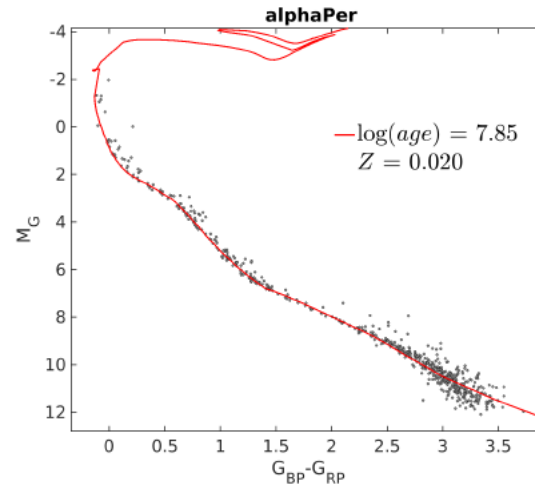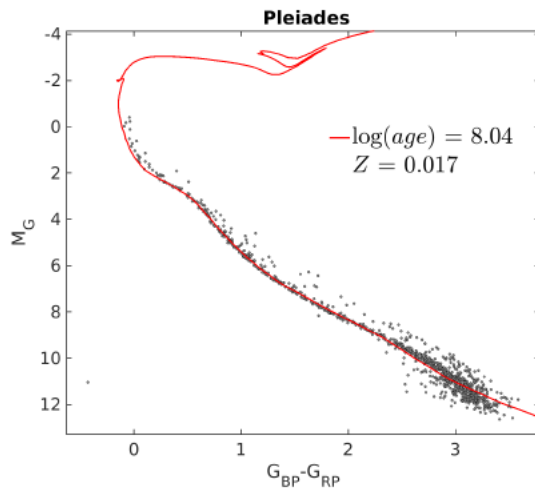(1,303,558 stars)
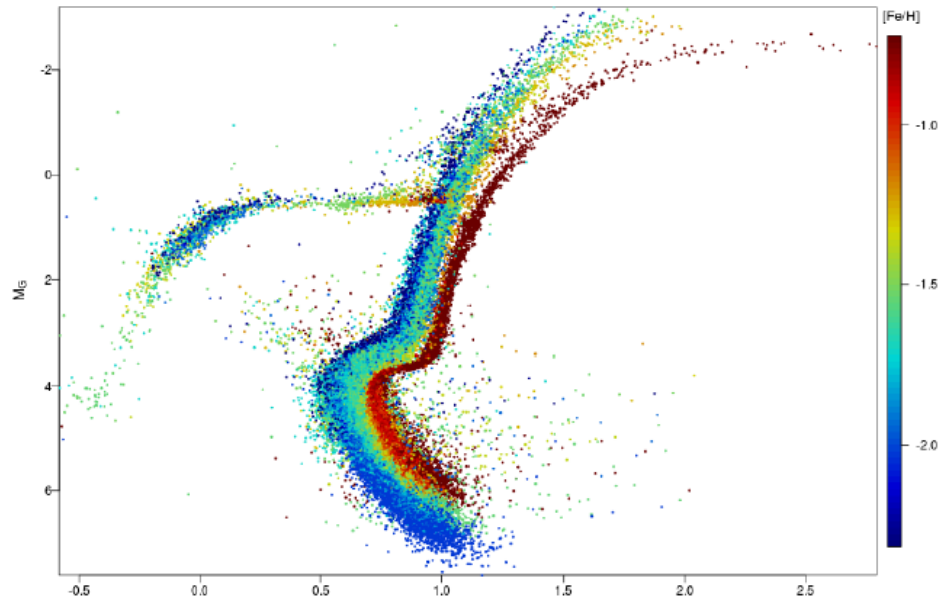
200 km/s $< V_T$
(64,727 stars)

Open clusters

32 open clusters
age dependence

Globular clusters

14 globular clusters
metallicity dependence