



# Chemical mapping of the stellar halo of the Milky Way

Guillaume Thomas

NRC Herzberg Astronomy & Astrophysics

@Thomas\_gft

guillaume.thomas@nrc-cnrc.gc.ca



## Introduction

- Gaia parallaxes too imprecise to measure distance beyond a few kpc → Use photometric distances
- Problem : need to discriminate the dwarfs and the giants → Data-driven Machine Learning based algorithm

## Discrimination Dwarfs/Giants, distance and metallicity from multi wavelength photometry

- From the CFIS-PS1-Gaia photometry :
  - \* Step 1: dwarf/giant classification
  - \* Step 2: estimate the metallicity → ~ 30% of contamination
  - \* Step 3: get the absolute magnitude
- Recover 70% of the giants with  $[Fe/H] < -1.0$
- $\sigma_{[Fe/H]} < 0.2$  dex
- Trained on SDSS/Segue, verified with Lamost and GCs/dSph

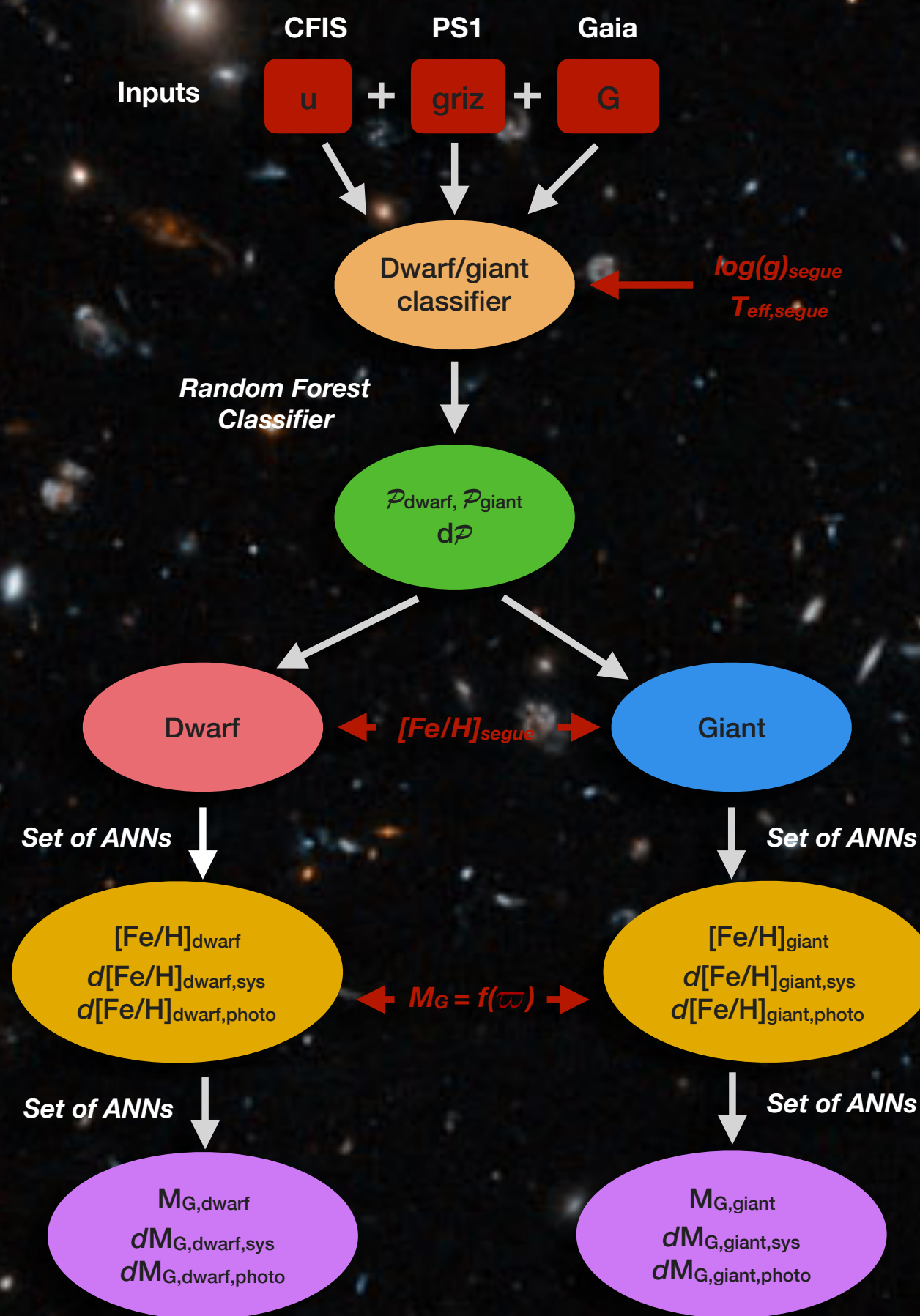


Fig 1. Illustration of the algorithm

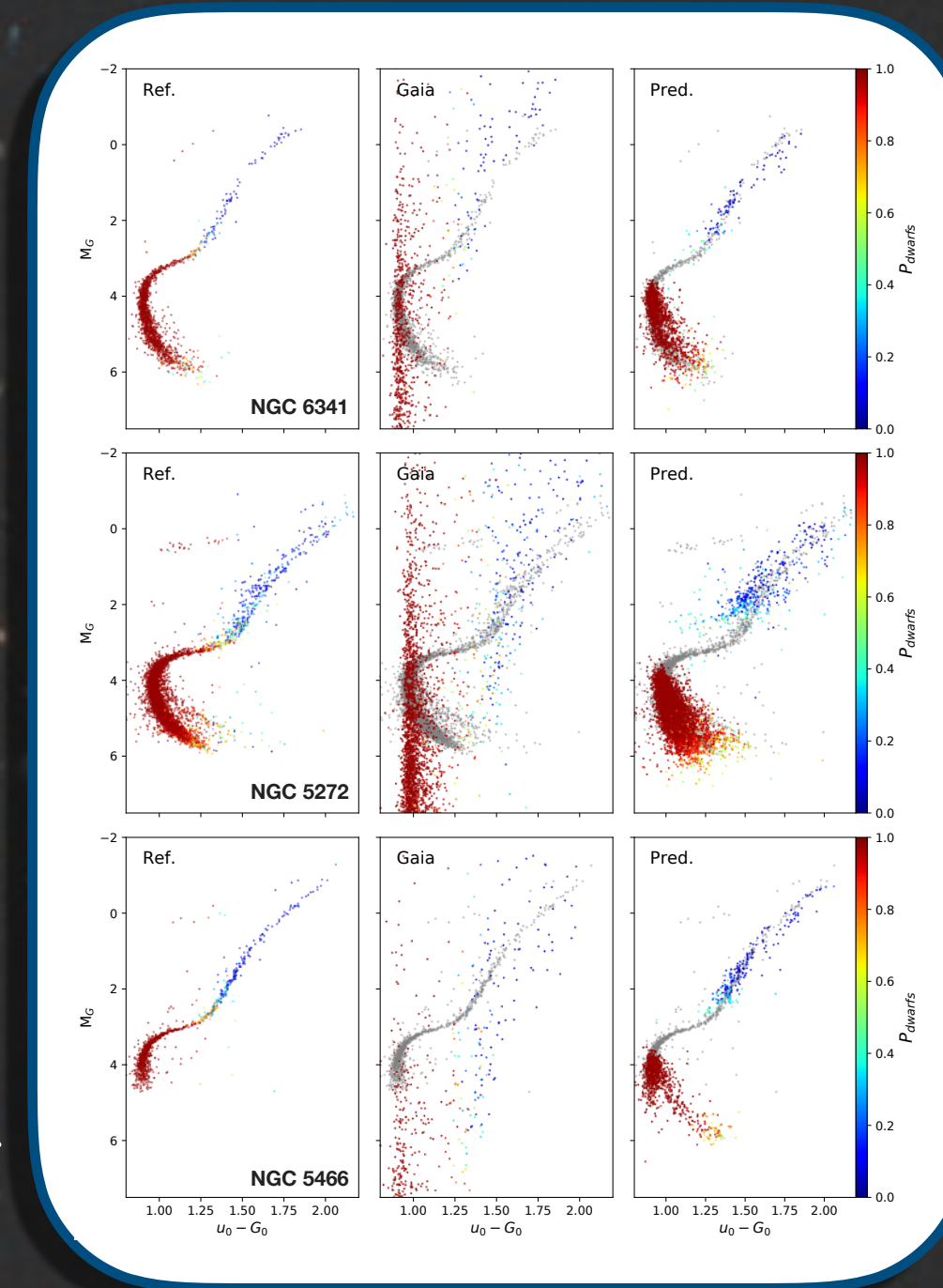
## Verification with Globular clusters

Fig 2. CMDs of 3 globular clusters calculated from:

\* the absolute magnitude predicted by the algorithm (right)

\* the Gaia parallaxes (middle)

\* the distance of the literature (left)



Precision of the distance :

- \* 17 % for the dwarfs
- \* 26 % for the giants

For more details please come and chat to me !