

Optical stellar spectroscopic insights into multi-wavelength astronomy

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GALAH (Galactic Archaeology with HERMES),
GECKOS, and 4MOST Surveys

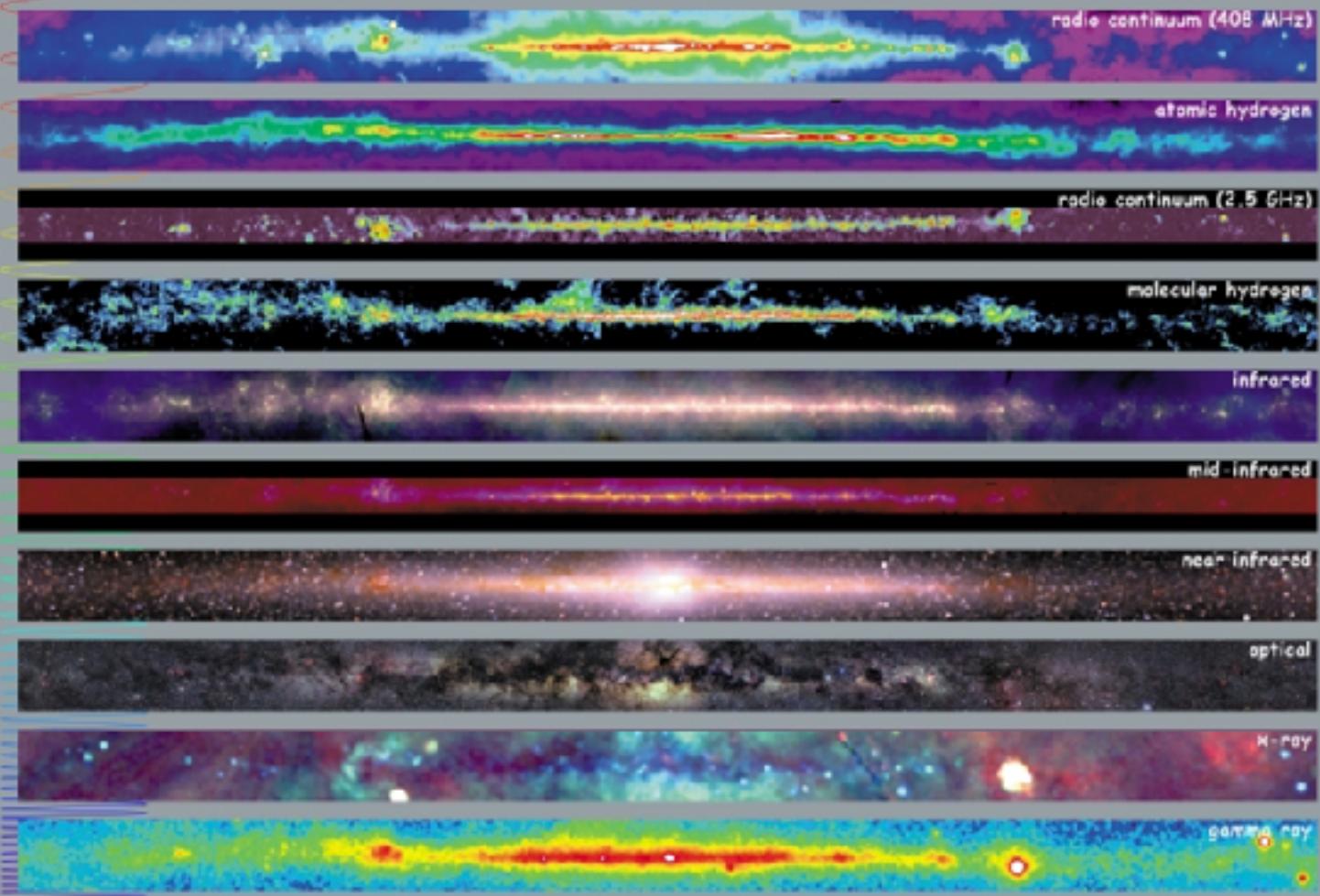


Australian
National
University



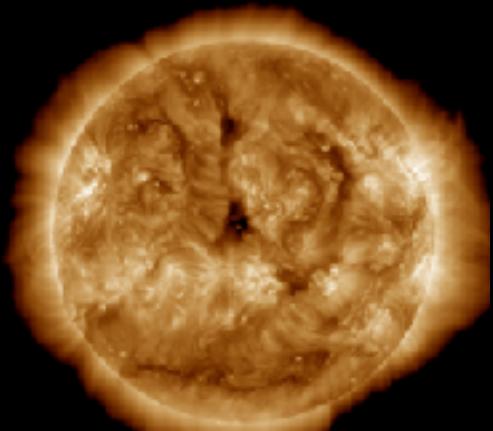
Australian Government
Australian Research Council



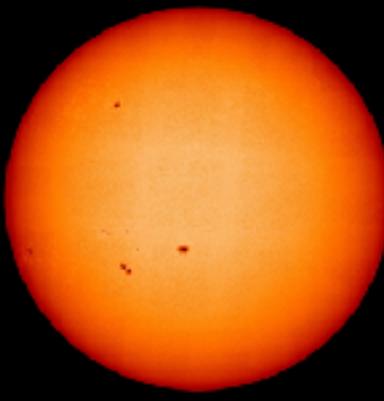


Multiwavelength Milky Way

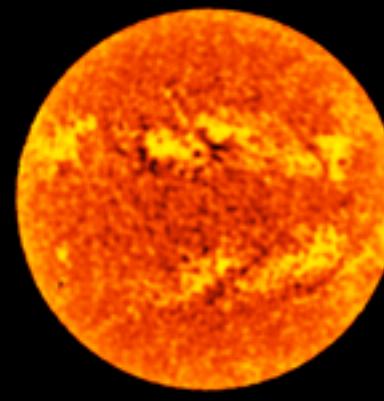
Stars at different wavelengths



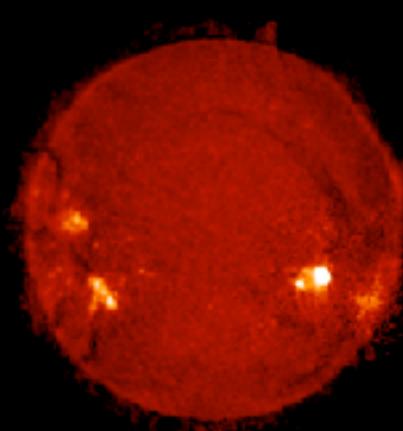
19.3 nm / 15.5 PHz
SDO (NASA)



617 nm / 486 THz
PHI (ESA/NASA)



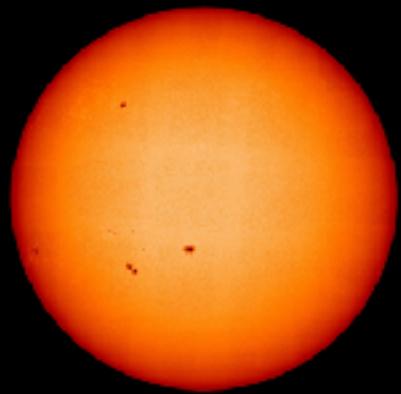
1.25 mm / 240 GHz
ALMA (ESO/NAOJ/NRAO)



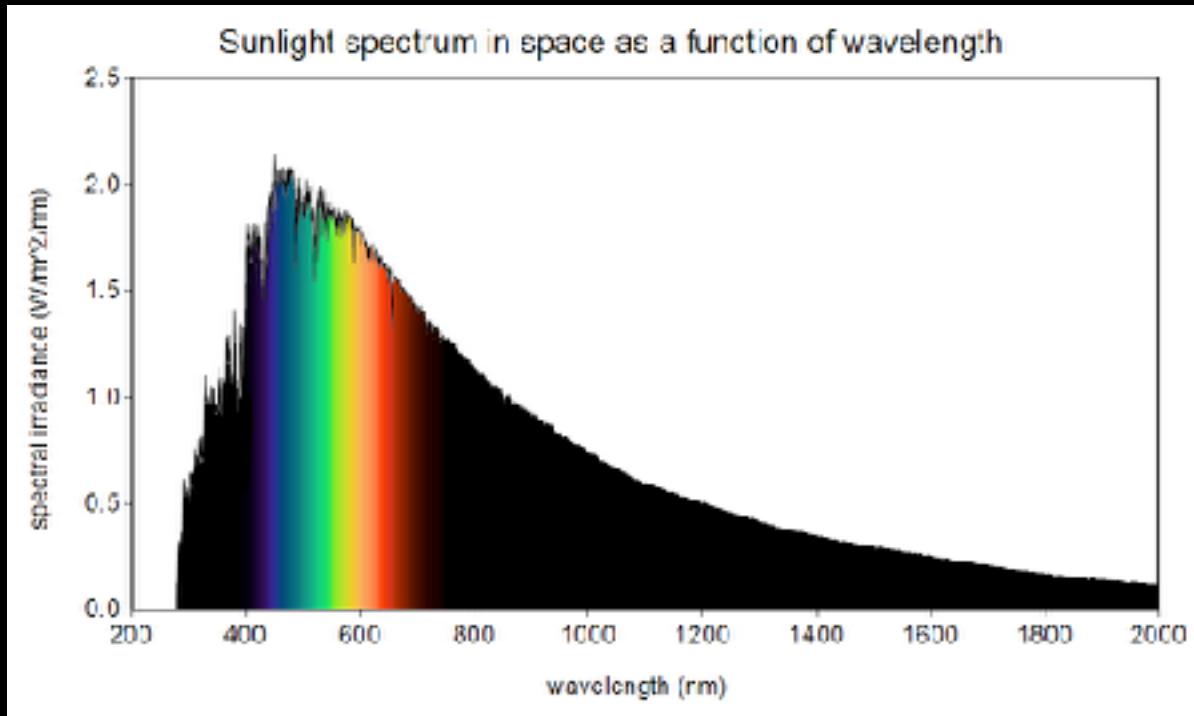
6.5 cm / 4.6 GHz
VLA (NRAO)



Optical stellar spectroscopy

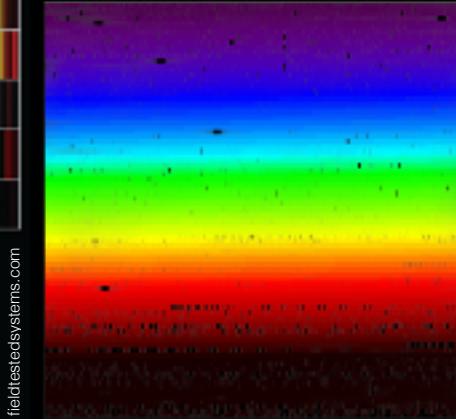


617 nm / 486 THz
PHI (ESA/NASA)

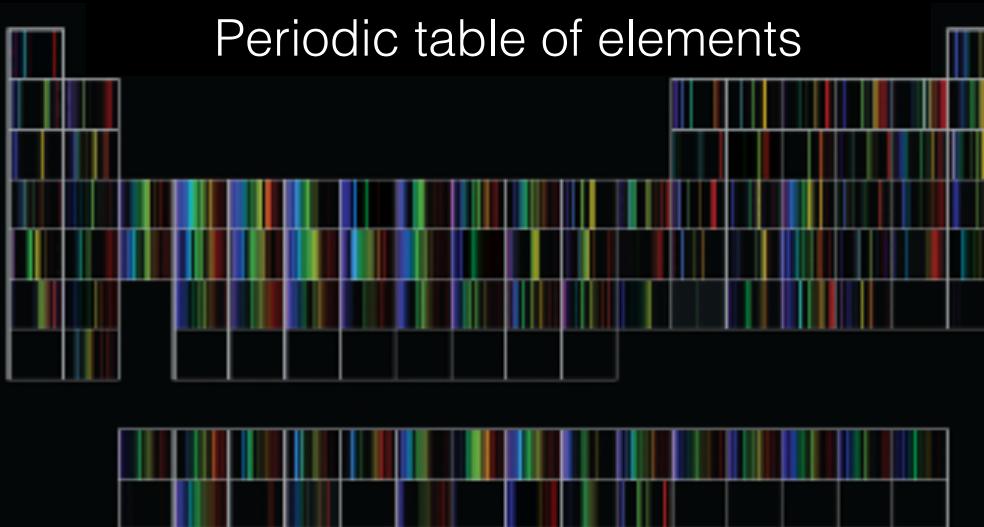


Optical stellar spectroscopy

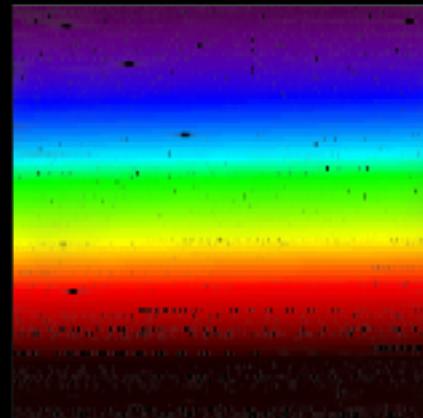
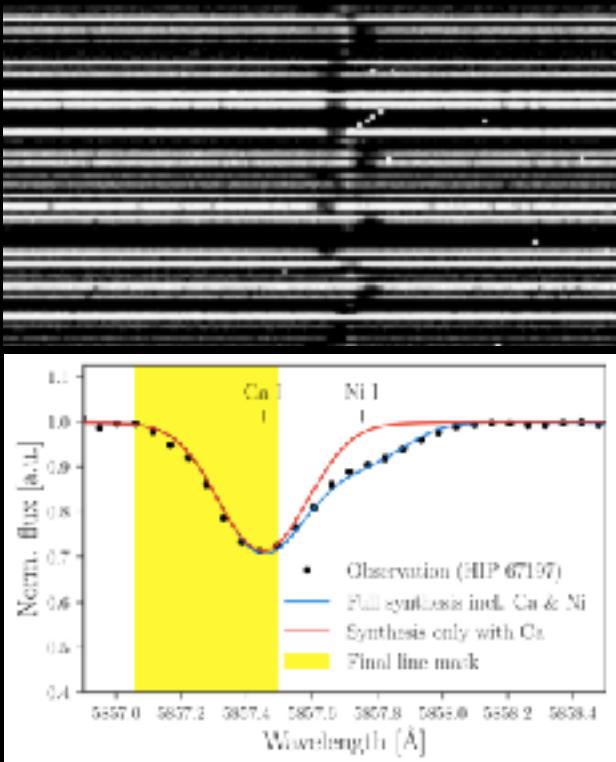
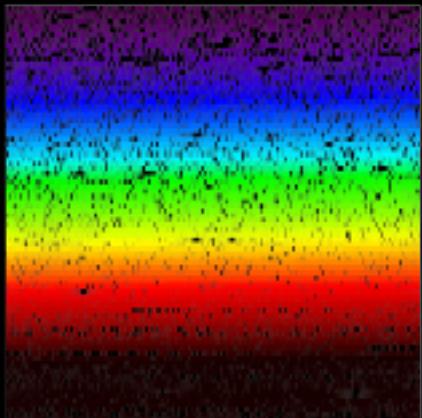
Periodic table of elements



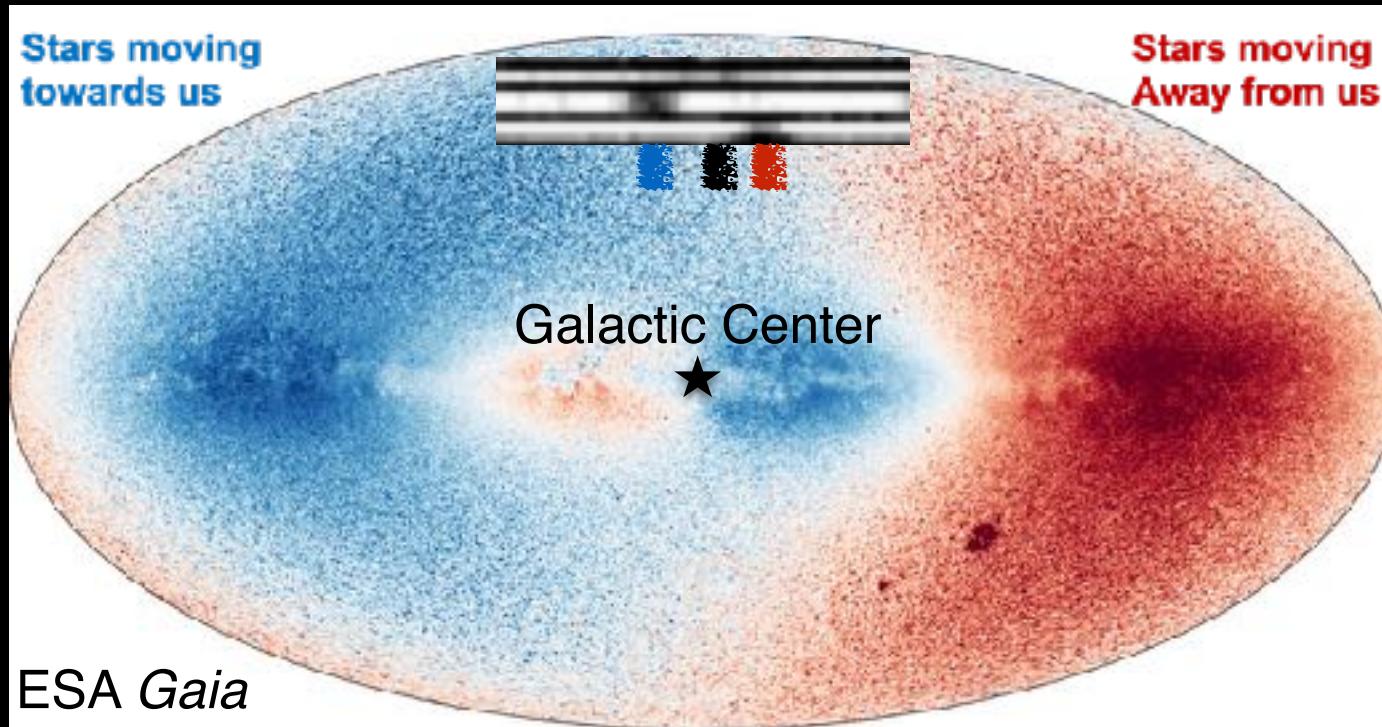
fieldtestedsystems.com



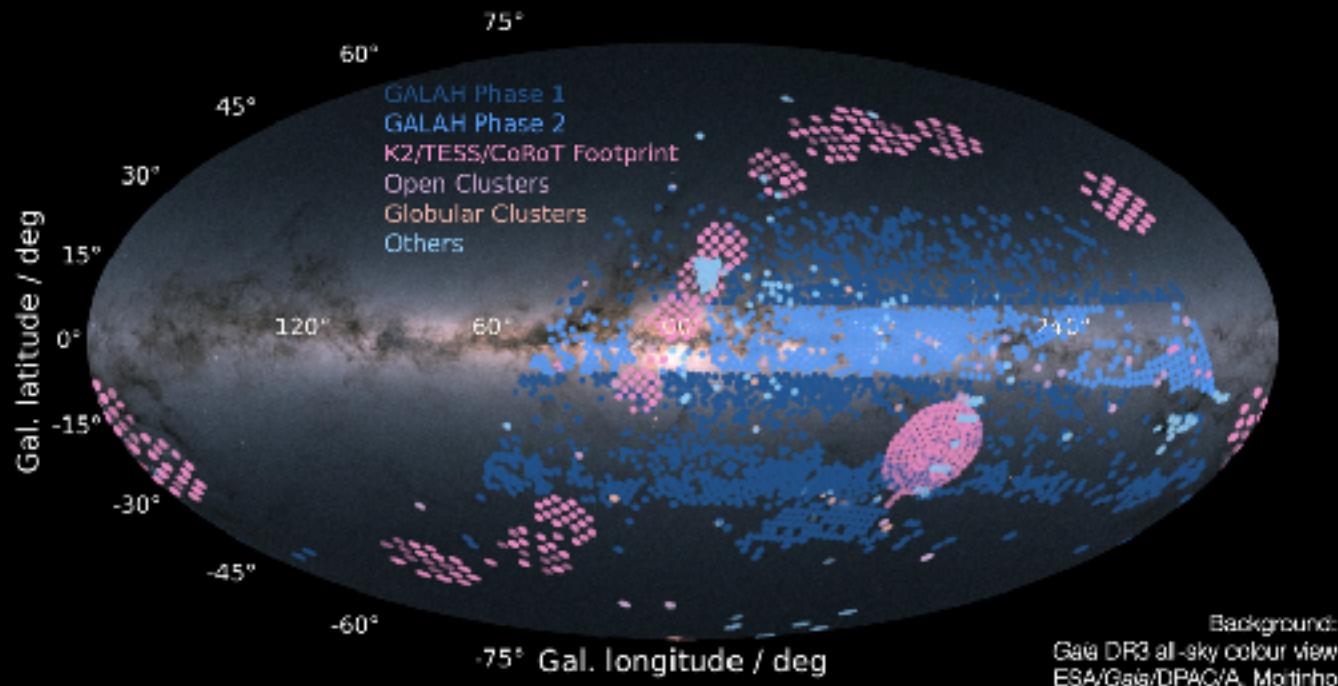
Optical stellar spectroscopy



Optical stellar spectroscopy: Radial Velocities



Galactic Archaeology with HERMES (GALAH)

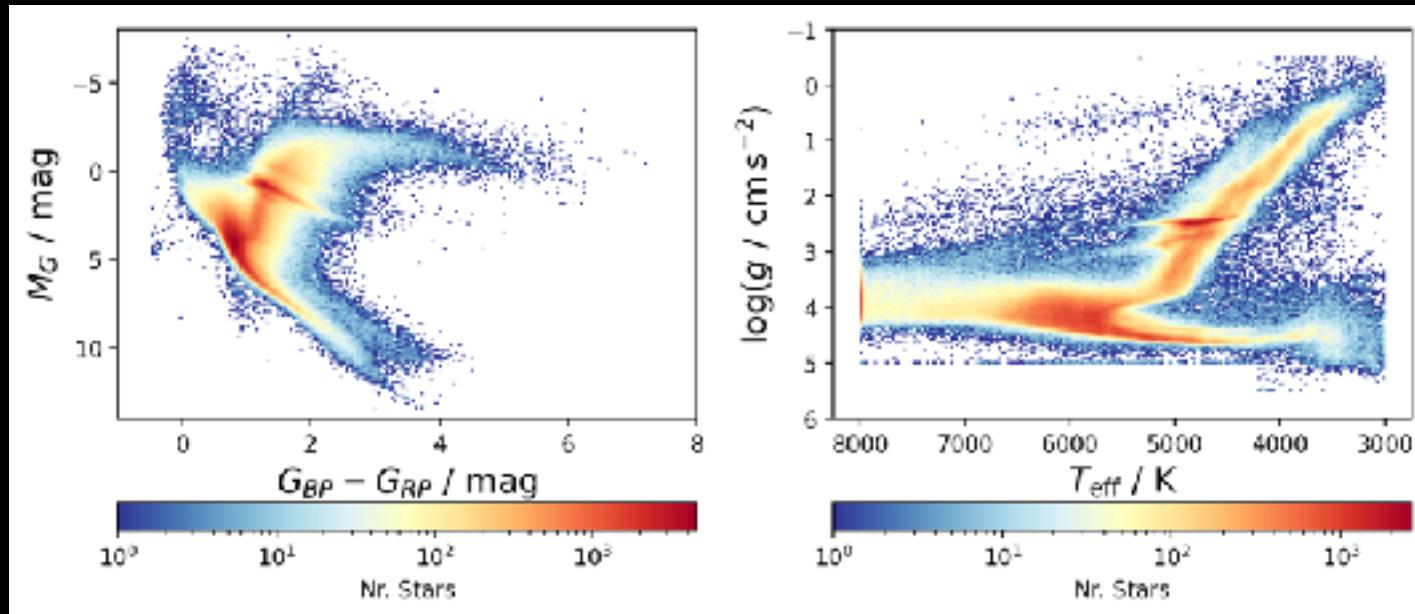


GALAH DR4: Buder et al. (2025)



Galactic Archaeology with HERMES (GALAH)

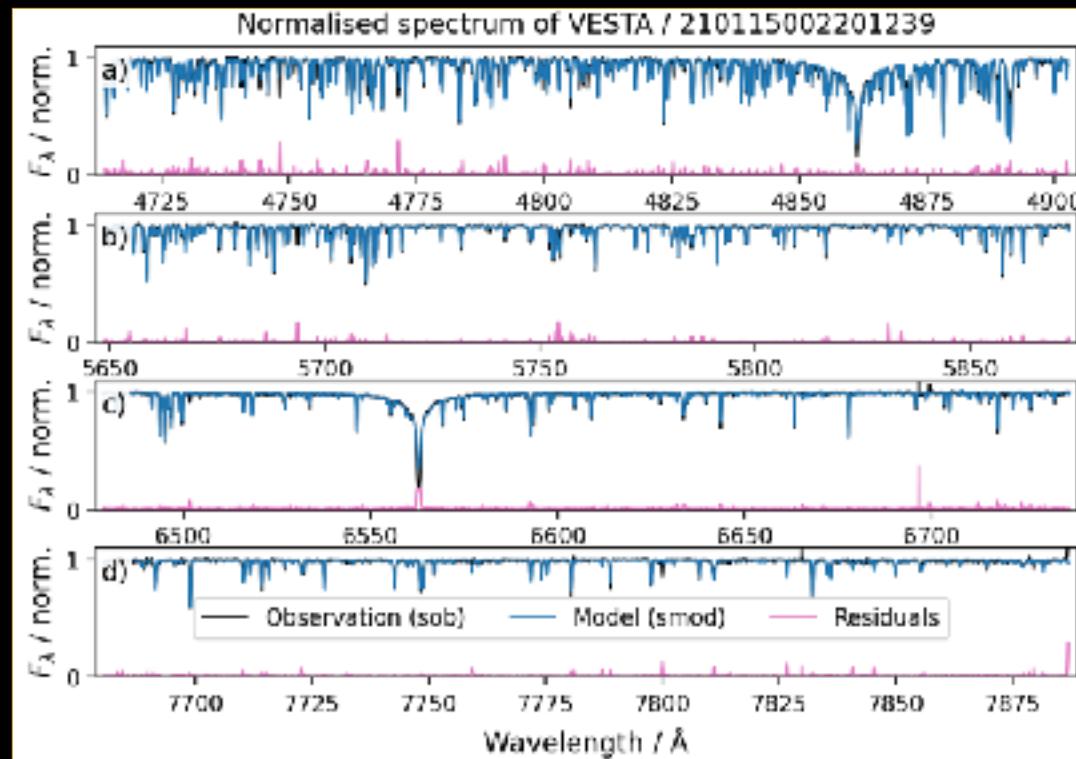
~ 1 million stars with $V < 14$ mag in the Solar neighbourhood



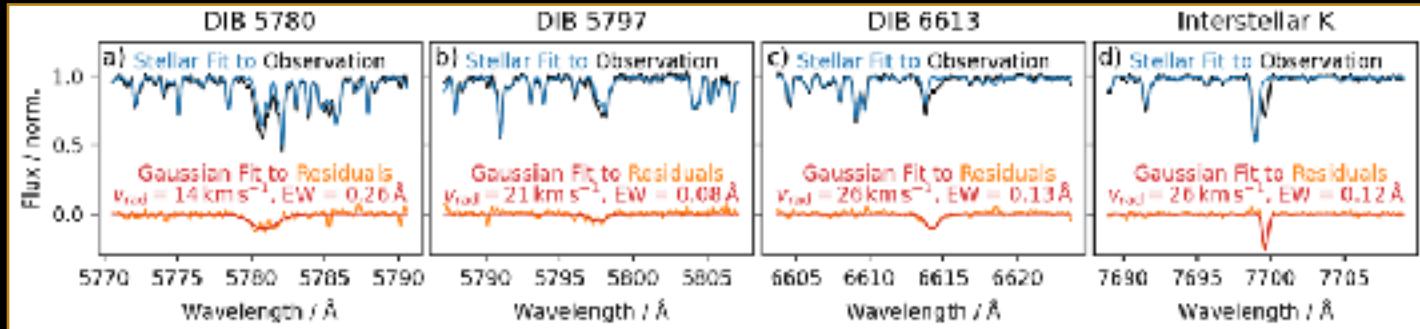
ALL with Gaia DR3 source_id & great photo- and astrometry



We measure elemental abundances of 32 elements



... and interstellar absorption

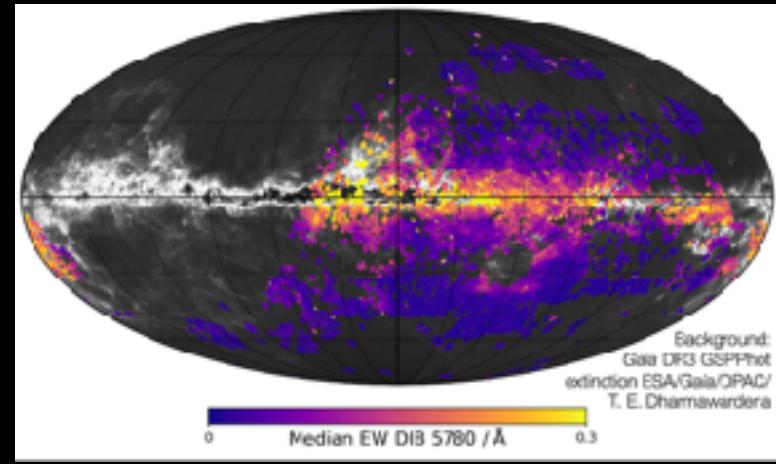


From diffuse media and Potassium:

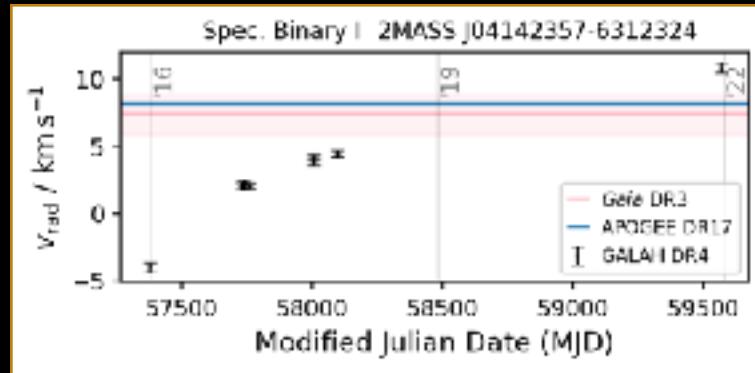
Equivalent Width \rightarrow column density

line-of-sight velocity

velocity dispersion



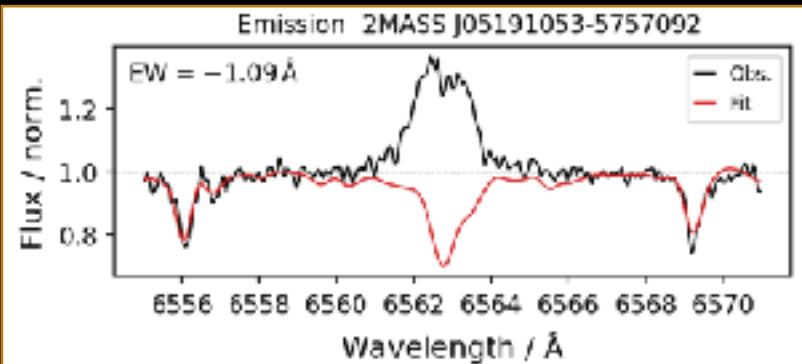
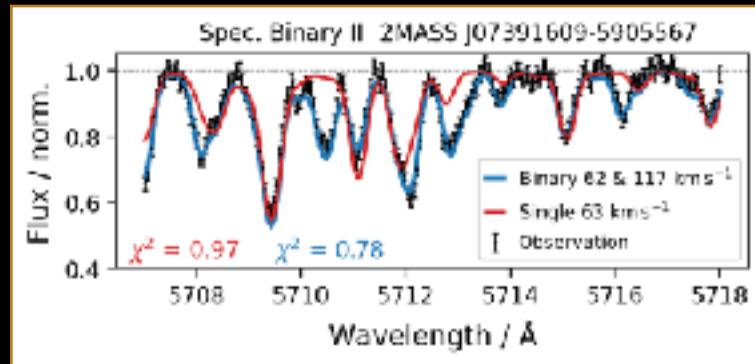
Galactic Archaeology with HERMES (GALAH)



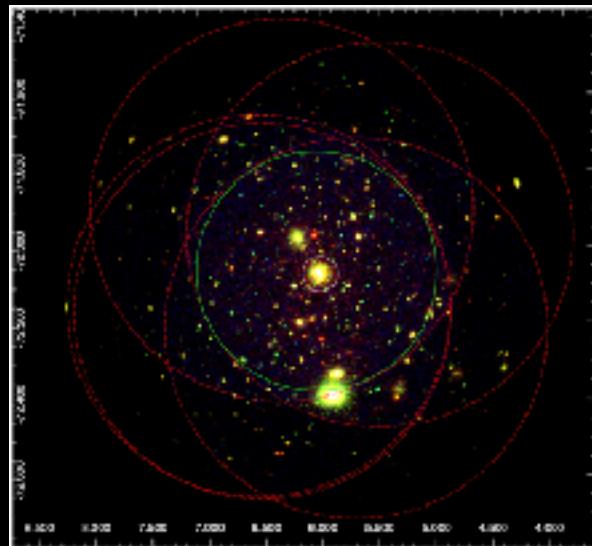
Spectroscopic (close) binaries!

Stars with hydrogen emission!

There are "quality" flags available
(read the manuscript or contact me)



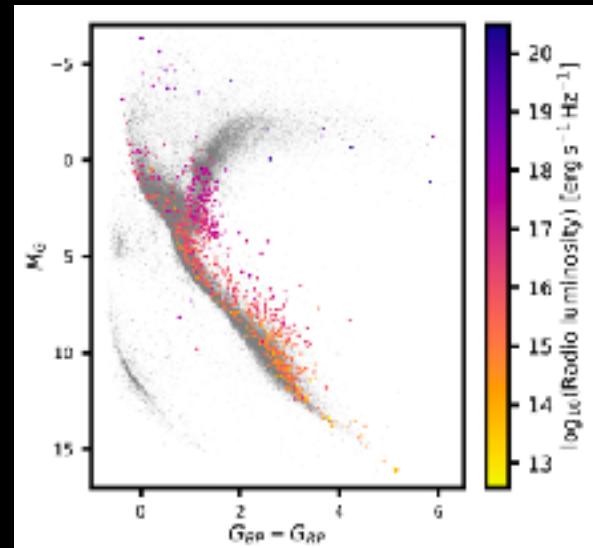
Any overlap of GALAH with X-ray or Radio?



X-Ray sources in the Globular Cluster 47 Tuc (Saeedi et al. 2022)?

eROSITA coronal content (Freund+, 2024)?

Cataclysmic variables in eROSITA (Freund+, 2024)?



Stars with Radio signals?
(Driessen et al. 2024)

Interstellar absorption similar/dissimilar to HI?

