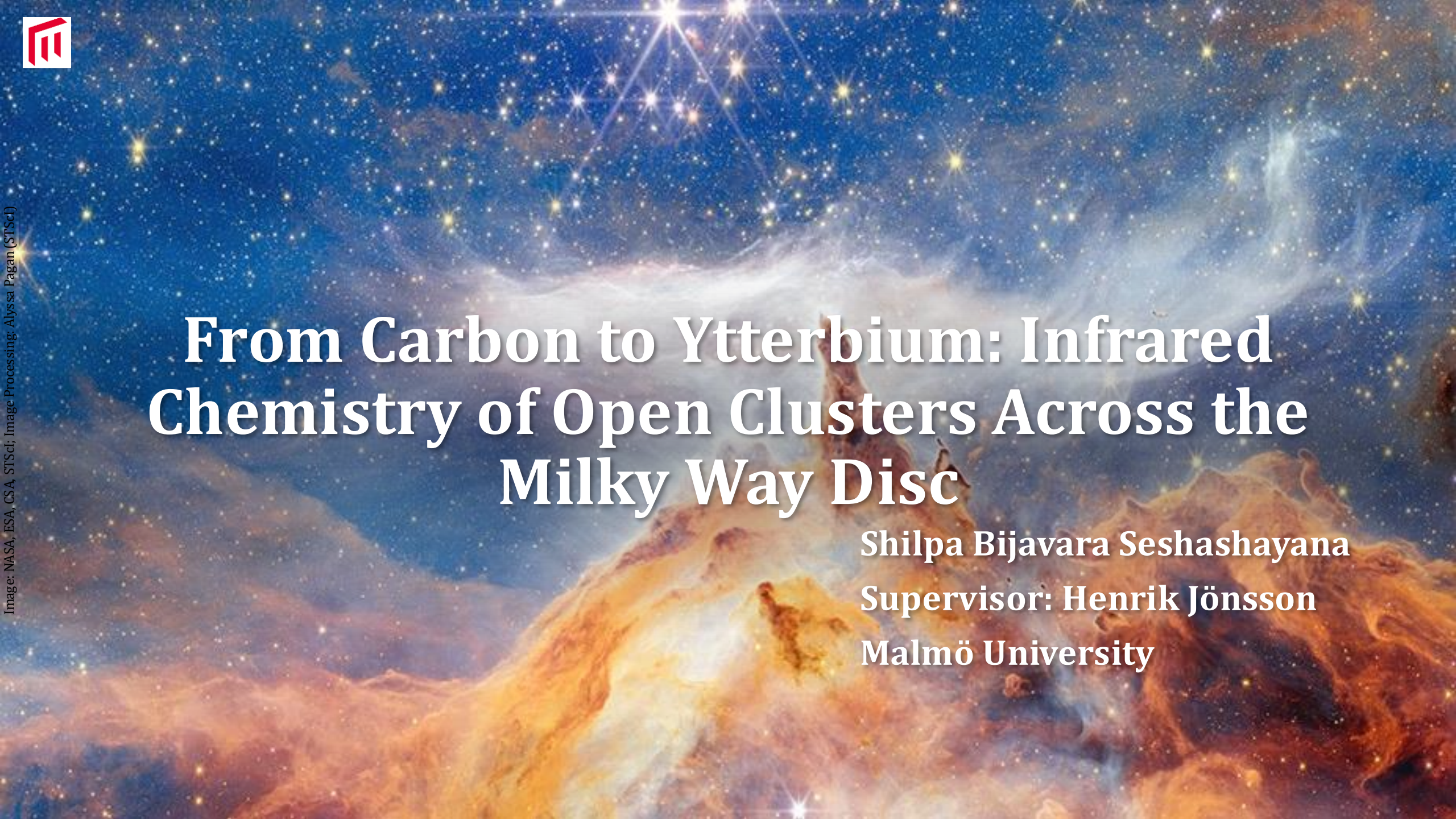
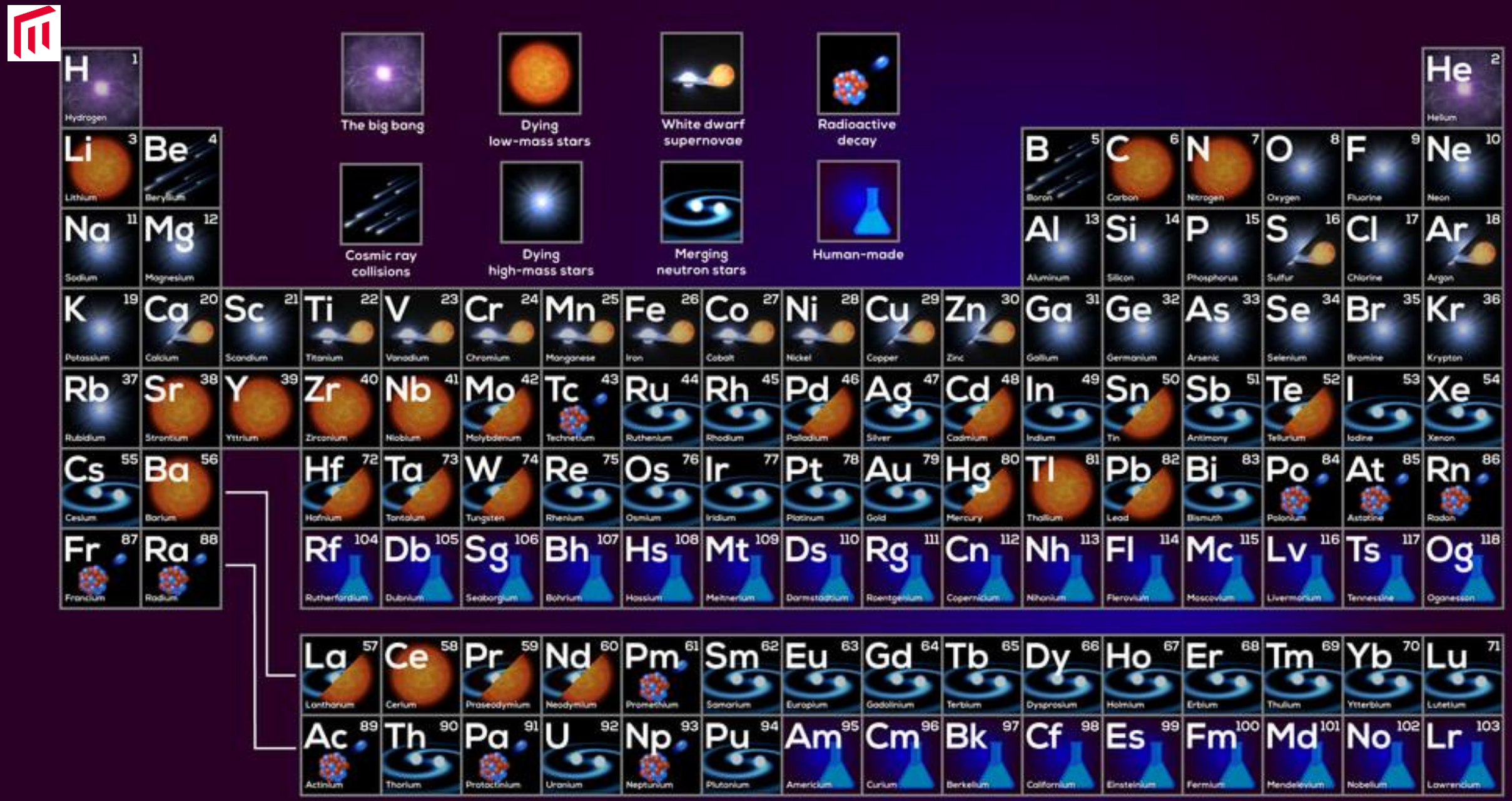


From Carbon to Ytterbium: Infrared Chemistry of Open Clusters Across the Milky Way Disc

Shilpa Bijavara Seshashayana
Supervisor: Henrik Jönsson
Malmö University

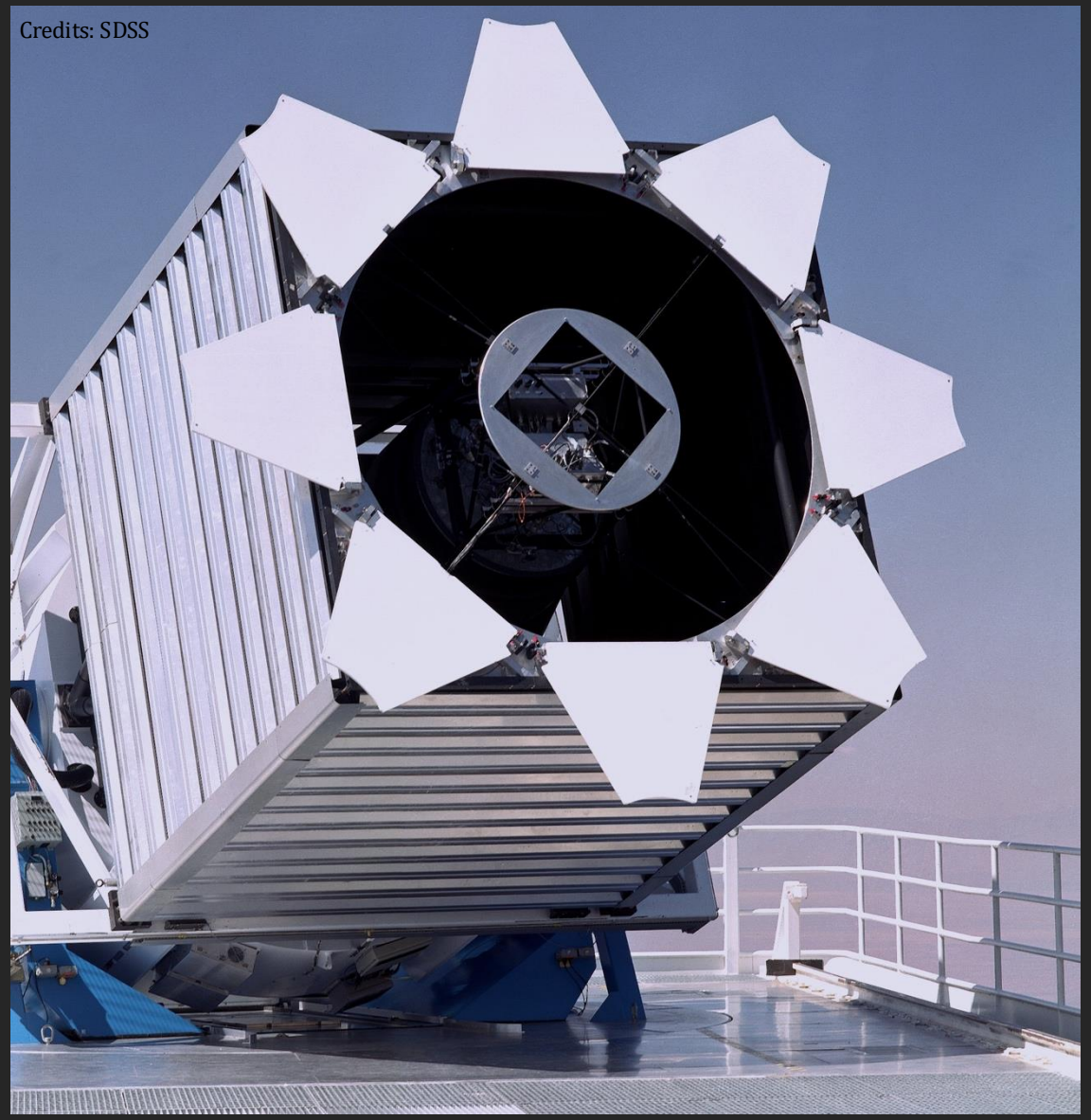
Image: NASA, ESA, CSA, STScI; Image Processing: Alyssa Pagan (STScI)

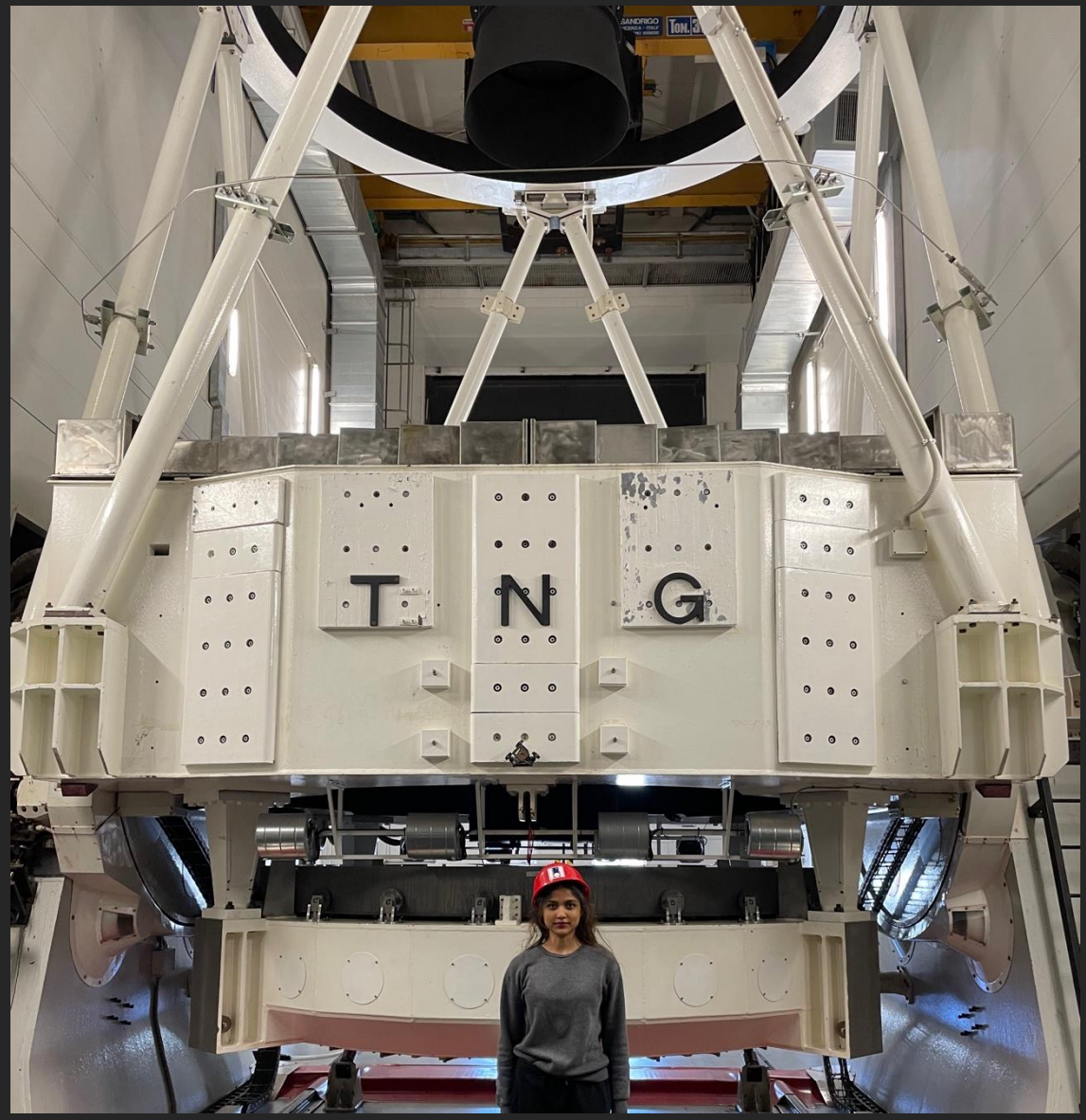


This periodic table depicts the primary source on Earth for each element. In cases where two sources contribute fairly equally, both appear.

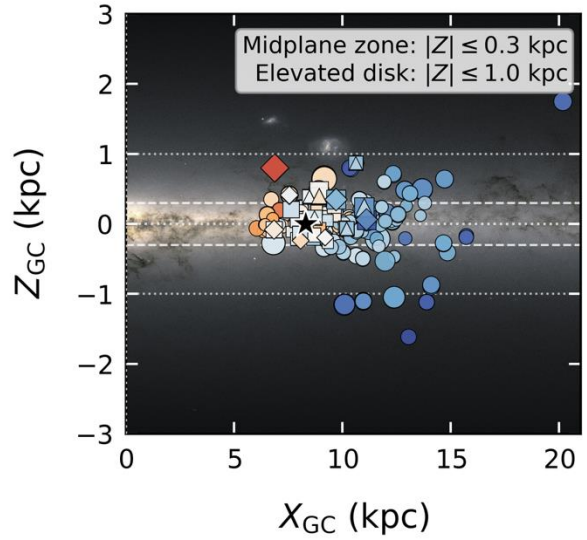
Why Open Clusters..?

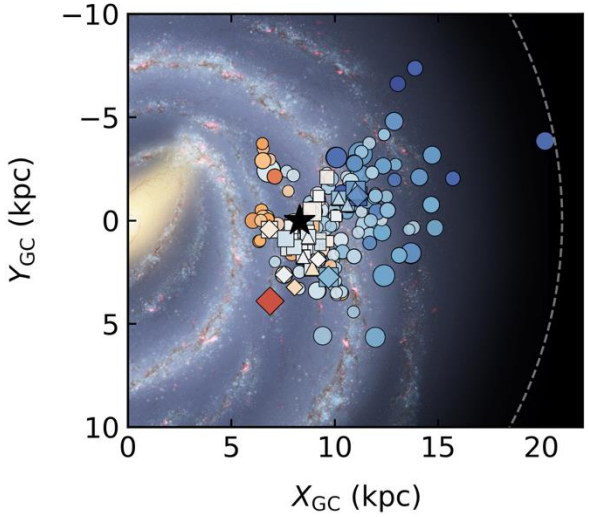
- Simple stellar populations
- Stars have similar age, distance, and chemical composition
- Properties are less uncertain than for field stars

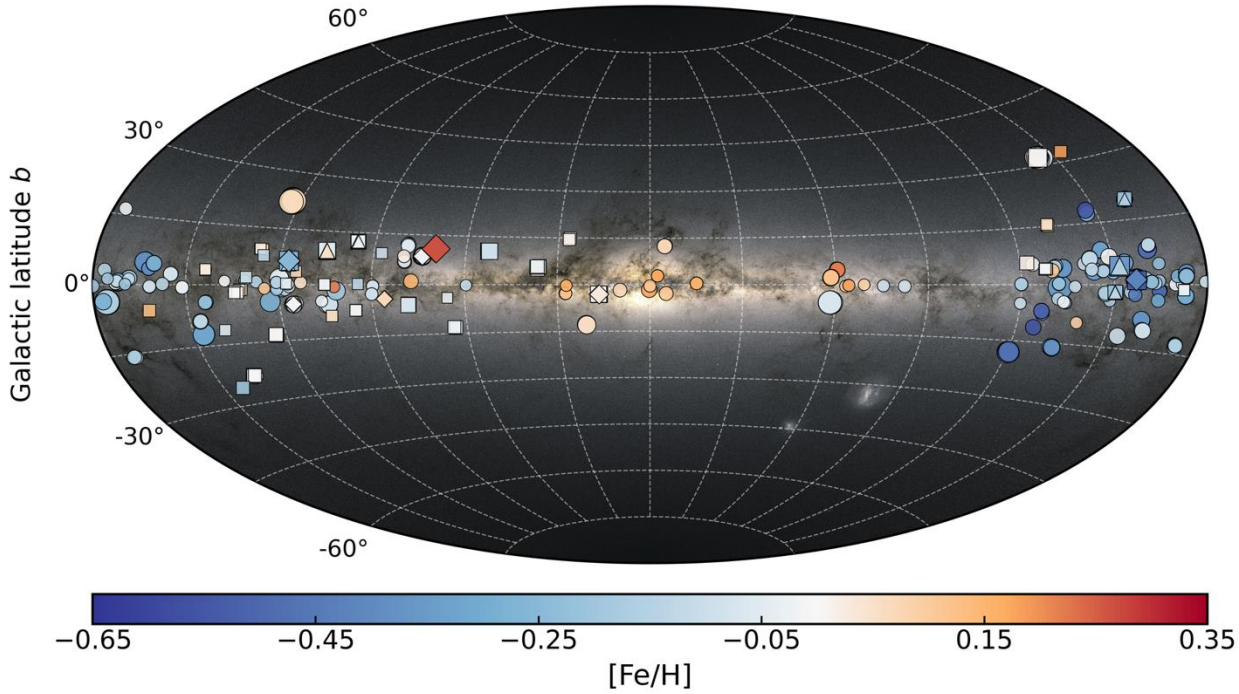

Credits: SDSS



The bird's eye view...





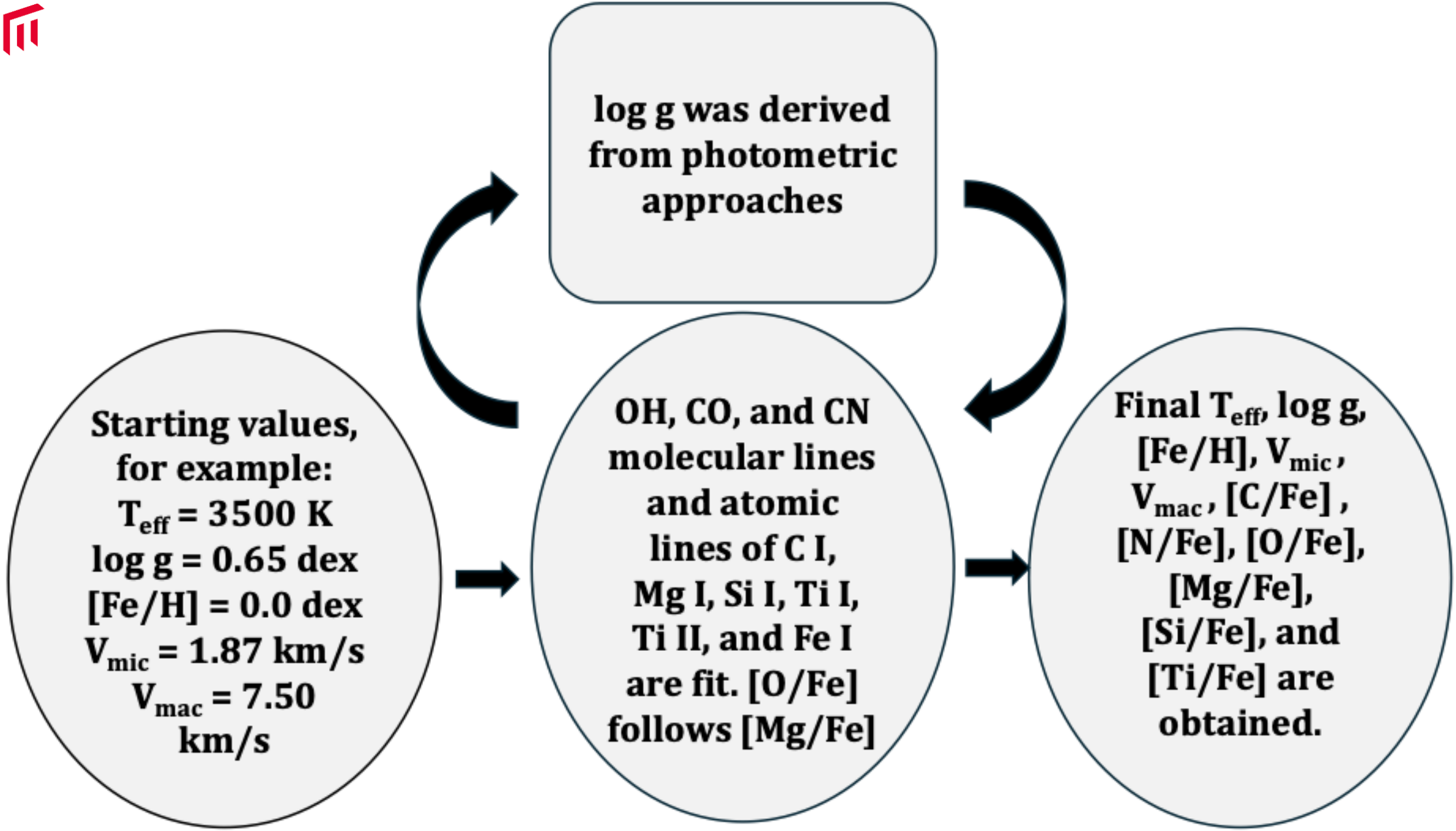


PySME

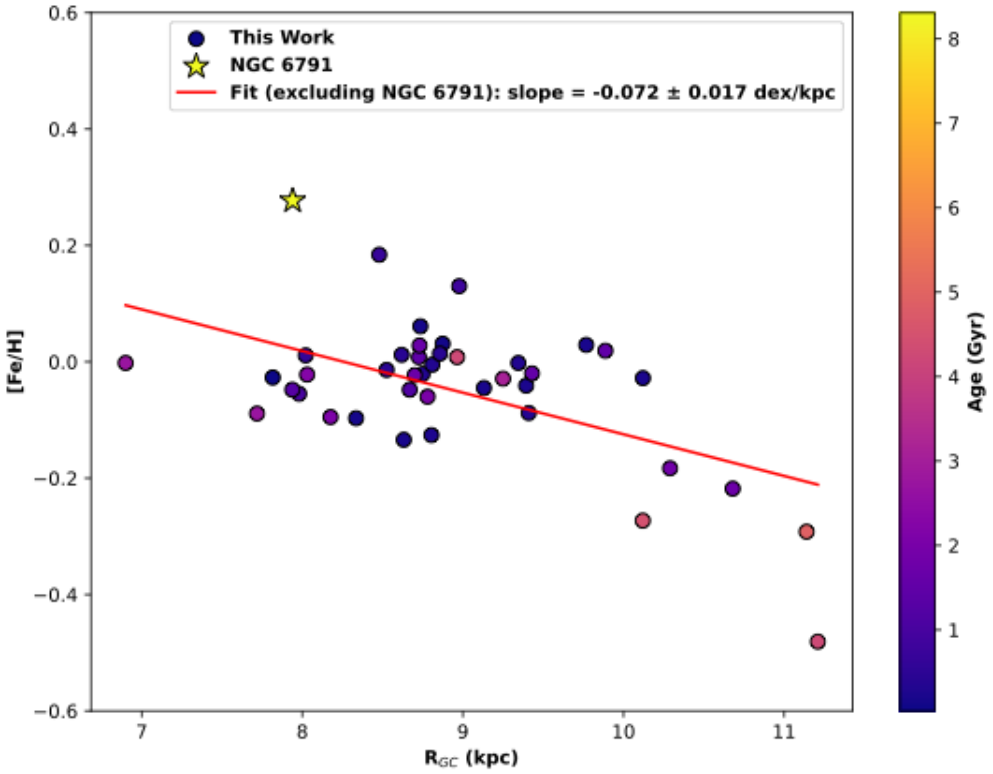
SPECTROSCOPY MADE EASIER

Analysis

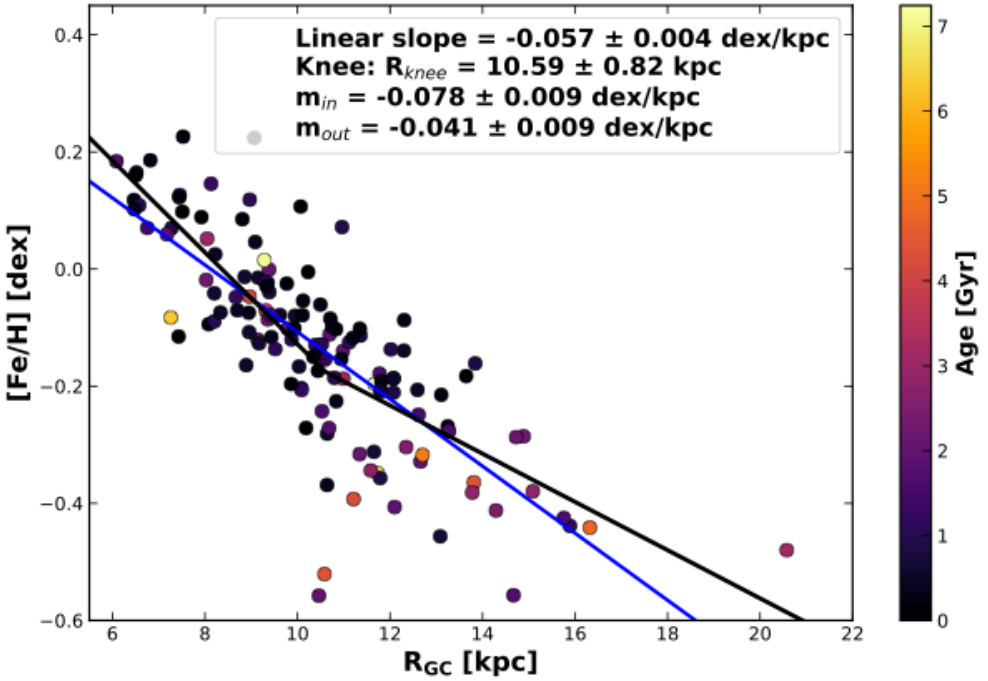
- It fits synthetic spectra to observed stellar spectra using χ^2 minimization
- Used to determine stellar parameters and elemental abundances


log g was derived from photometric approaches
Starting values, for example: T_{eff} = 3500 K log g = 0.65 dex [Fe/H] = 0.0 dex V_{mic} = 1.87 km/s V_{mac} = 7.50 km/s
OH, CO, and CN molecular lines and atomic lines of C I, Mg I, Si I, Ti I, Ti II, and Fe I are fit. [O/Fe] follows [Mg/Fe]
Final T_{eff}, log g, [Fe/H], V_{mic}, V_{mac}, [C/Fe], [N/Fe], [O/Fe], [Mg/Fe], [Si/Fe], and [Ti/Fe] are obtained.

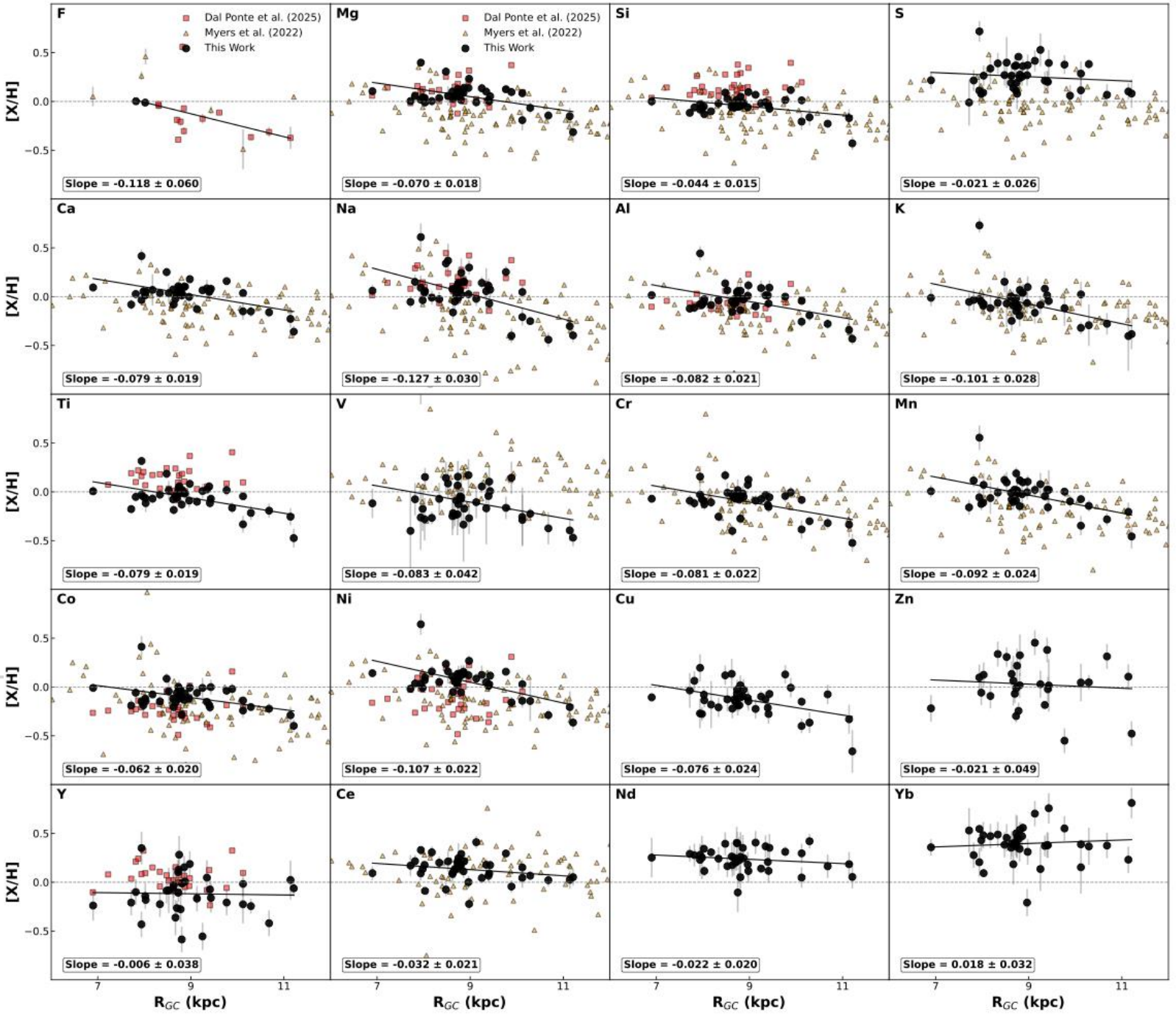
GIANO-B spectra..!



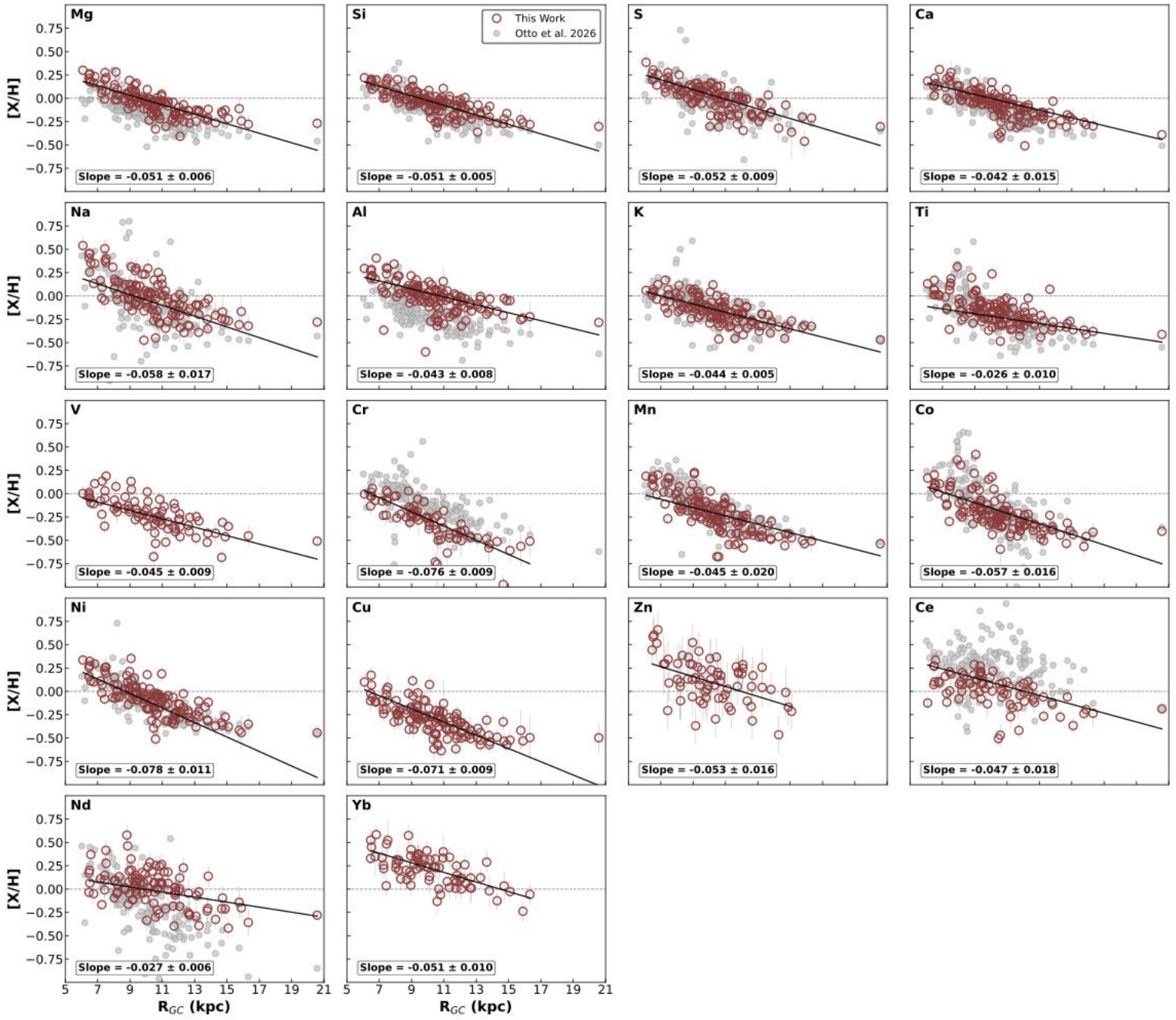
Milky way Mapper spectra..!



GIANO-B spectra..!



Milky Way Mapper spectra..!



Final tea from the Galactic Disc…

- Open clusters are basically the main characters for tracing Galactic disc chemical evolution
- The results back an inside-out growth scenario for the Milky Way disc

THANK YOU..!
Questions, comments, existential crises..?

I am currently looking for postdoctoral opportunities!

If you are hiring, collaborating, or just want to talk Milky Way chemistry, please contact me.

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