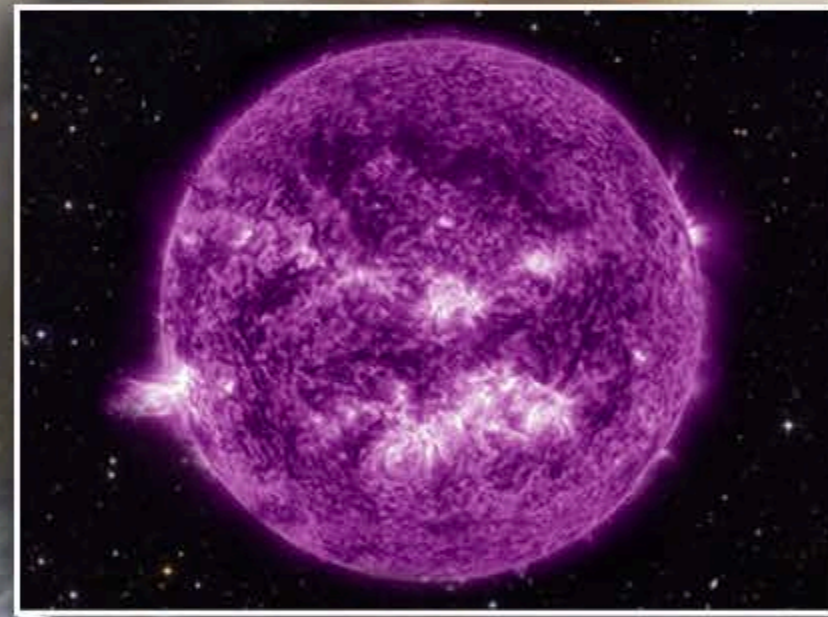
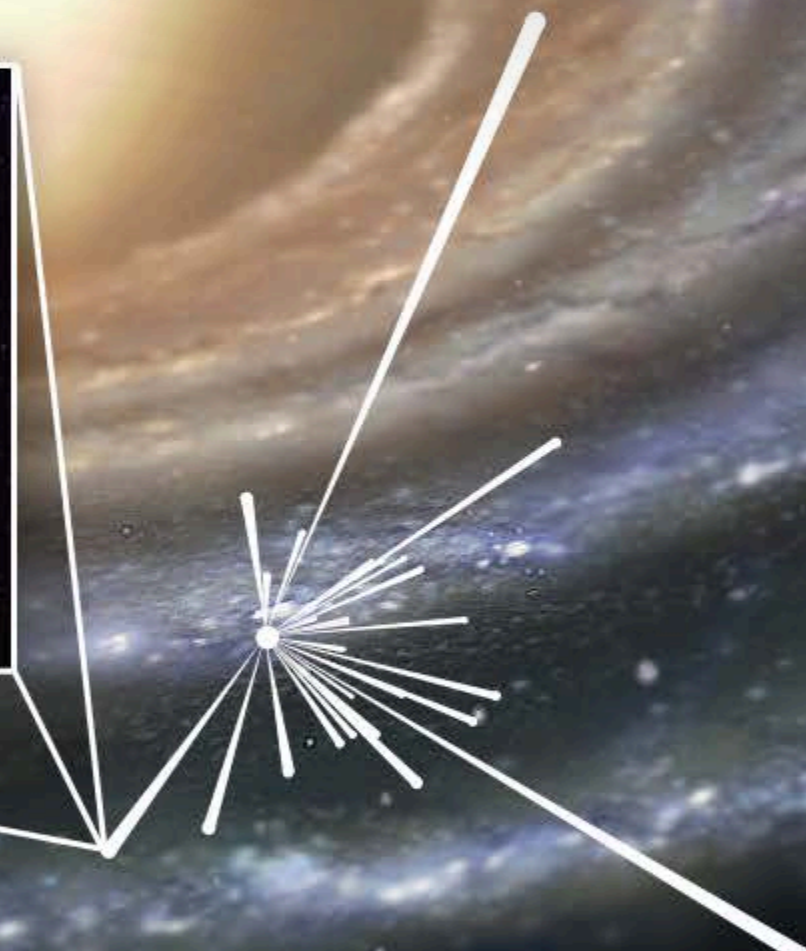




The T-GEX project II

Chemical fingerprints and Galactic origins of UV-bright FGK stars



Diego Beltrán Flores

BSc in Astronomy

d_beltran@uc.cl



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The T-GEX series of papers



The T-GEX project

I. Stealth UV-bright Sun-like stars in the Galaxy as candidate contributors to the UV upturn

M. L. L. Dantas^{1,†,★}, D. Beltrán^{1,†}, R. E. Giribaldi², R. Smiljanic³, P. R. T. Coelho⁴, and P. B. Tissera¹

¹ Instituto de Astrofísica, Pontificia Universidad Católica de Chile, Av. Vicuña Mackenna 4860, Santiago, Chile

² INAF – Osservatorio Astrofisico di Arcetri, Largo E. Fermi 5, Firenze, 50125, Italy

³ Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, ul. Bartycka 18, 00-716, Warsaw, Poland

⁴ Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Universidade de São Paulo, R. do Matão 1226, São Paulo, 05508-090, Brazil



ArXiv: 2607.27324



The T-GEX project

II. Chrono-chemo-dynamic signatures of UV-bright FGK stars

D. Beltrán^{1,†,★}, M. L. L. Dantas^{1,†,★★}, R. Smiljanic², and P. B. Tissera¹

¹ Instituto de Astrofísica, Pontificia Universidad Católica de Chile, Av. Vicuña Mackenna 4860, Santiago, Chile

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ArXiv: 2609.19257



Quick reminder of T-GEX's groups

Three UV-defined groups:

Group 1 (G1)

Extreme
UV-abnormal
stars

Group 3 (G3)

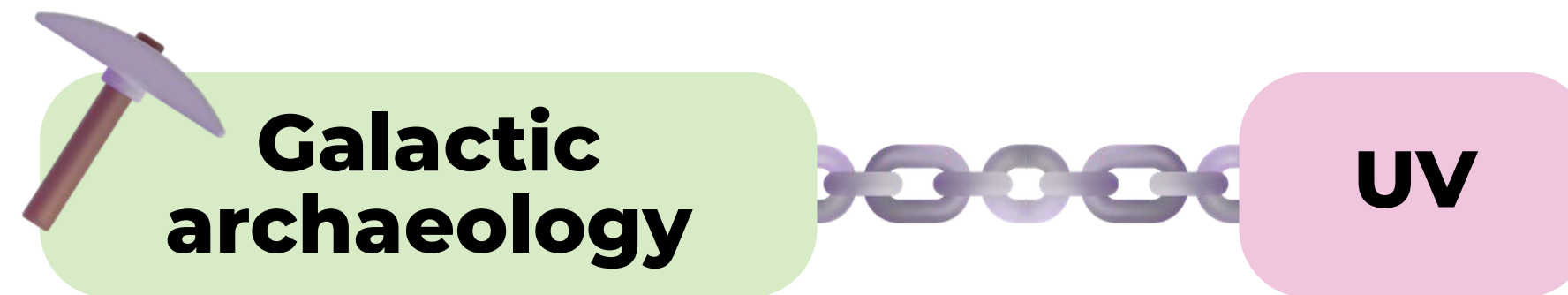
Intermediate
UV-abnormal
stars

Group 2 (G2)

UV-normal
stars

The questions after T-GEX I

- Do these stars share a common Galactic origin?
- Do they carry a chemical fingerprint of their formation history?



The T-GEX project

II. Chrono-chemo-dynamic signatures of UV-bright FGK stars

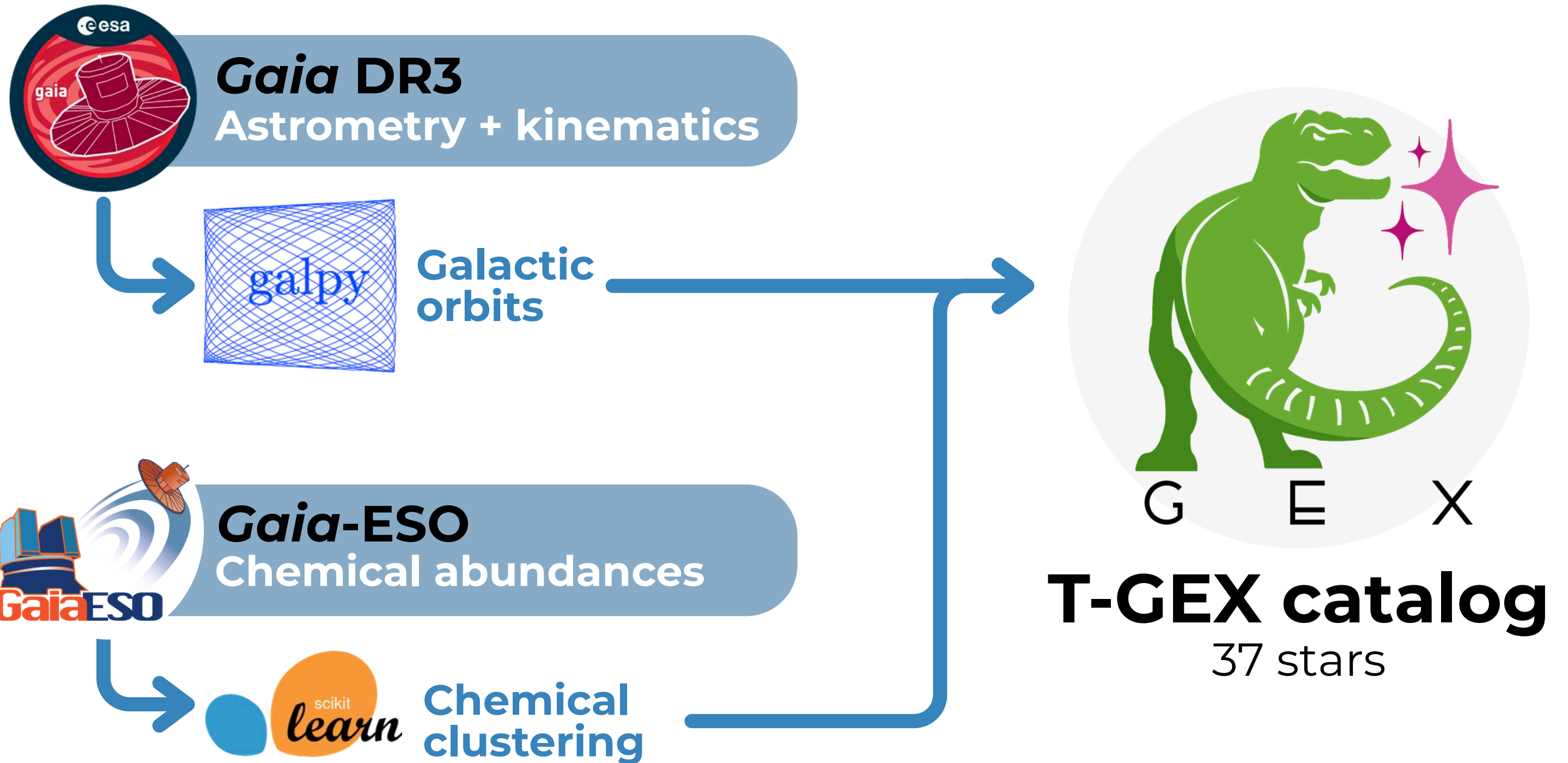
D. Beltrán^{1,†,*}, M. L. L. Dantas^{1,†**}, R. Smiljanic², and P. B. Tissera¹

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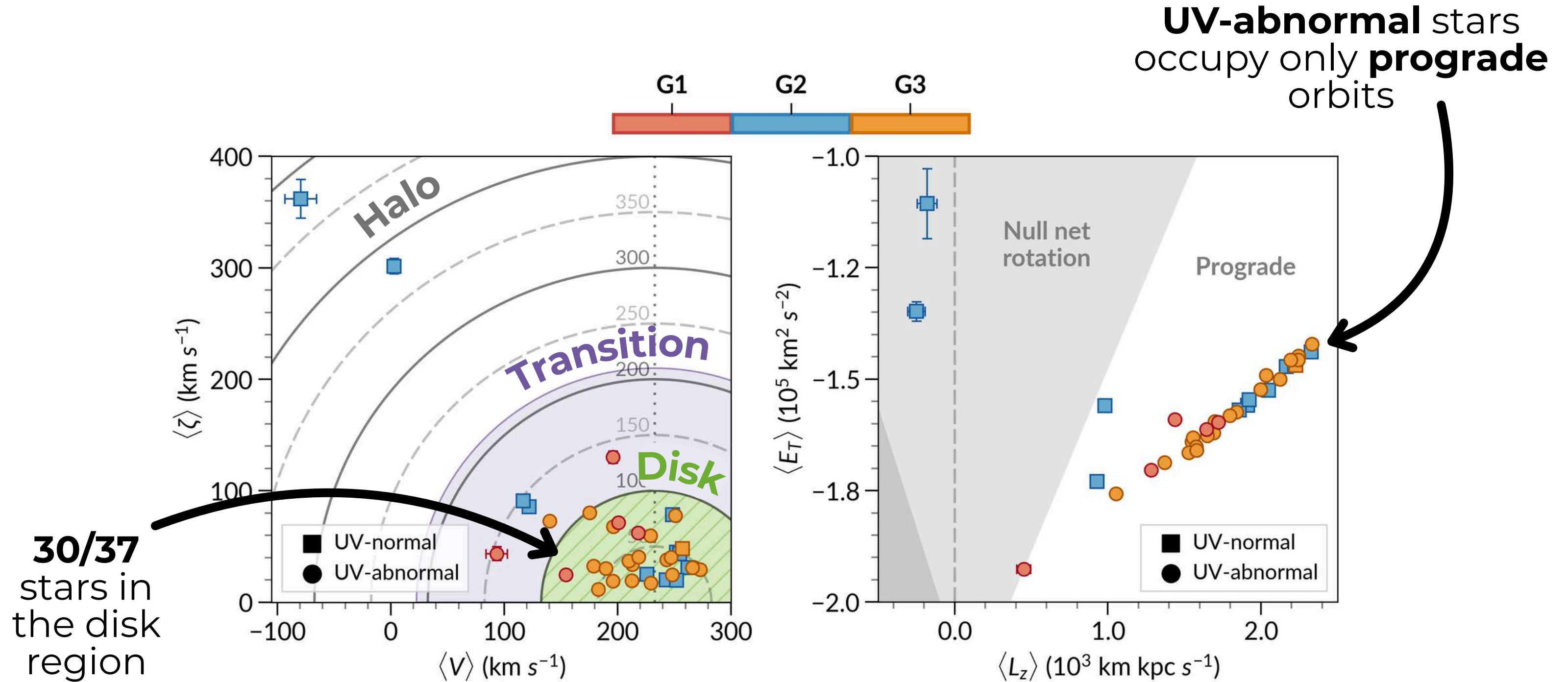
² Nicolaus Copernicus Astronomical Center, Polish Academy of Sciences, ul. Bartycka 18, 00-716, Warsaw, Pol

The focus of this talk!

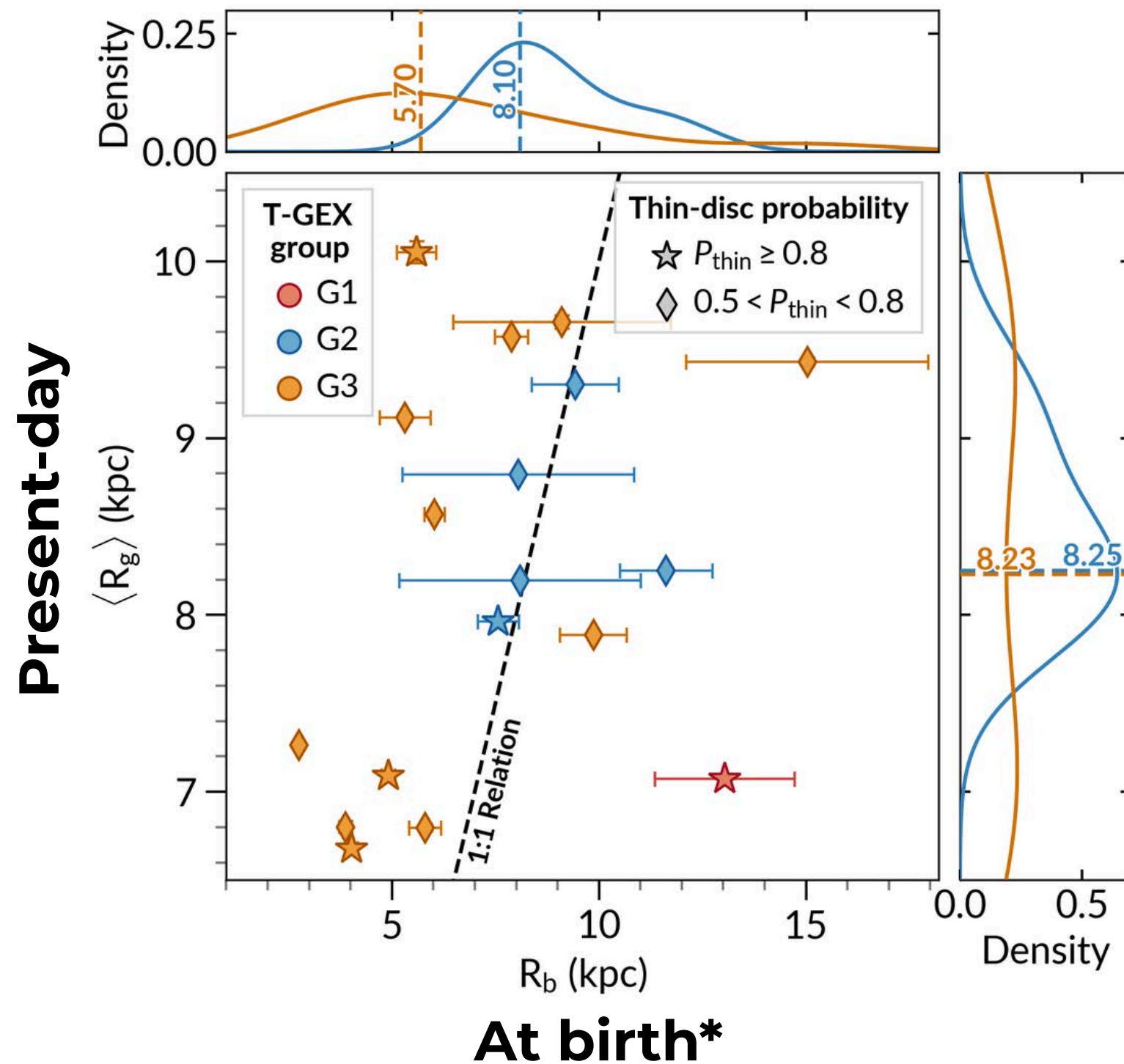
T-GEX: now adding chemo-dynamics



Not a Halo population



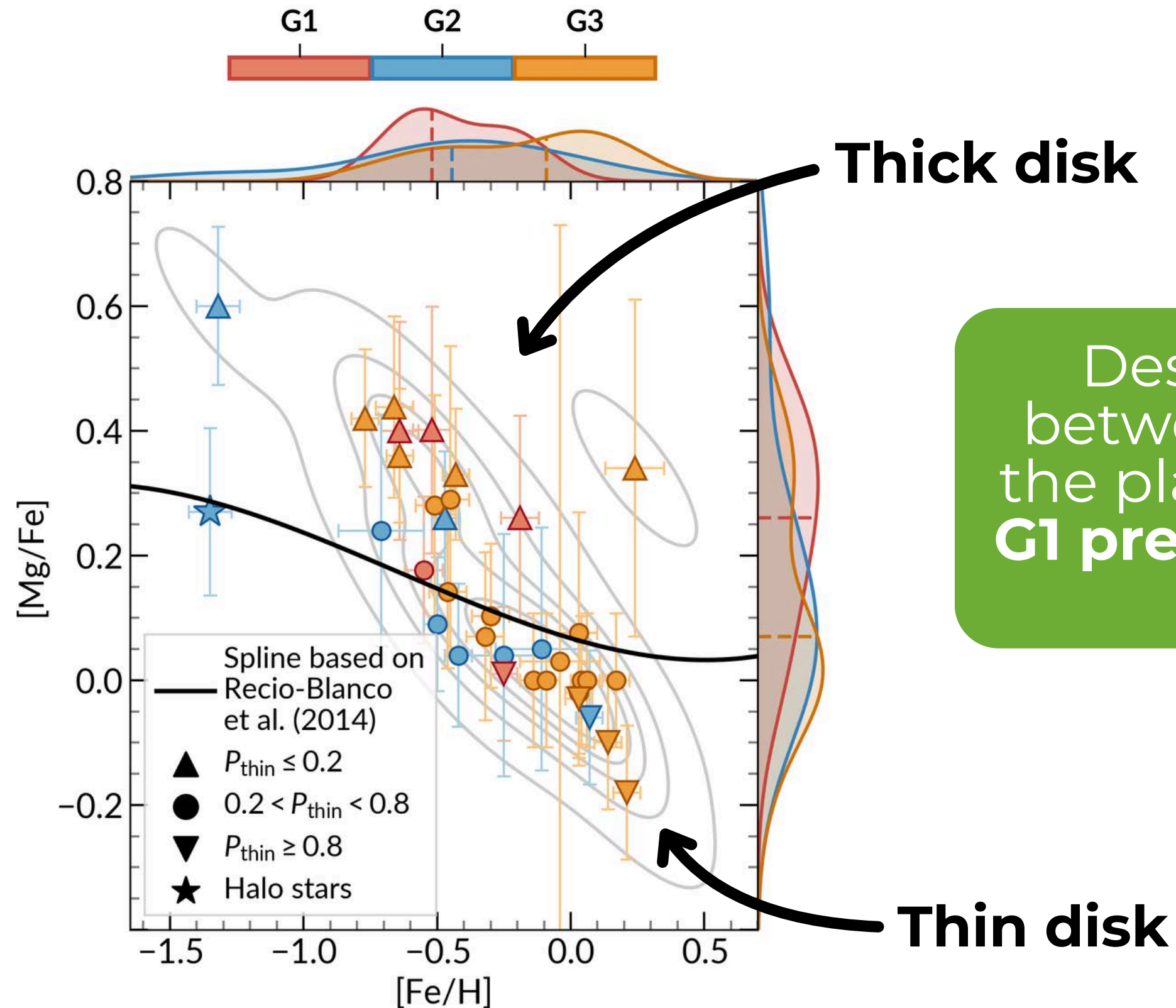
Looking back at their birthplaces



Some UV-excess stars **may** have formed farther **inward**

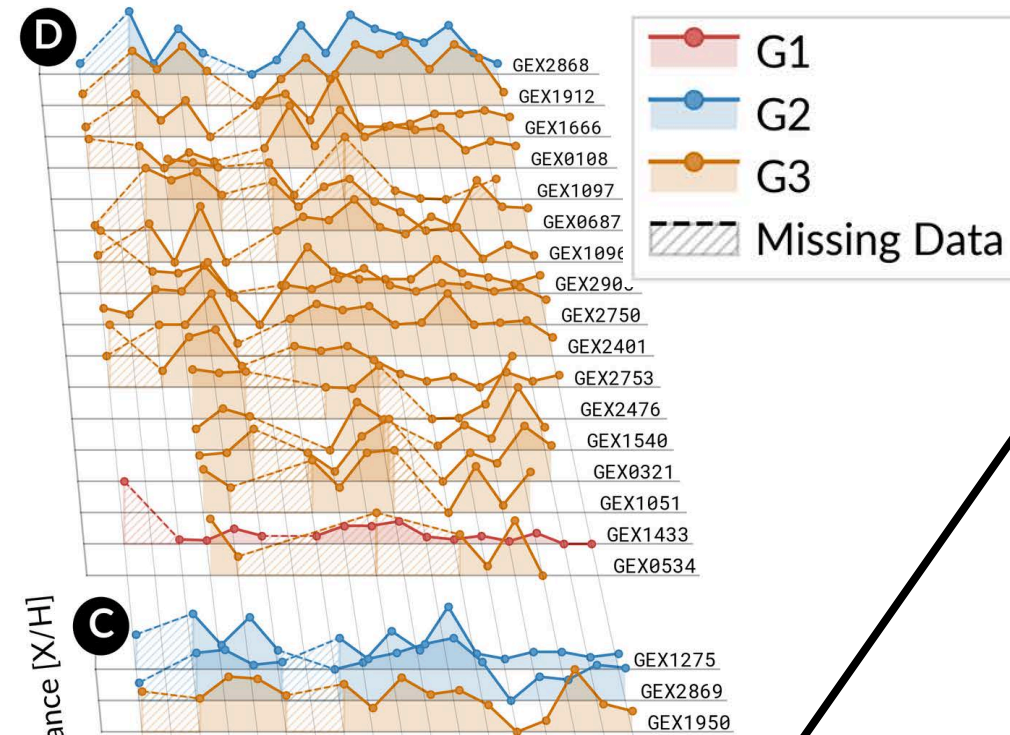
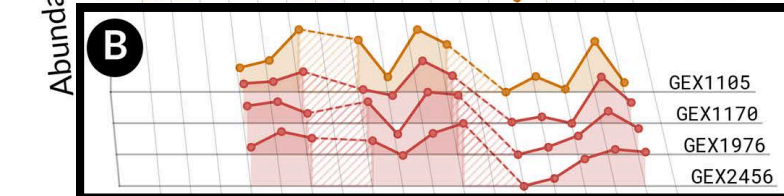
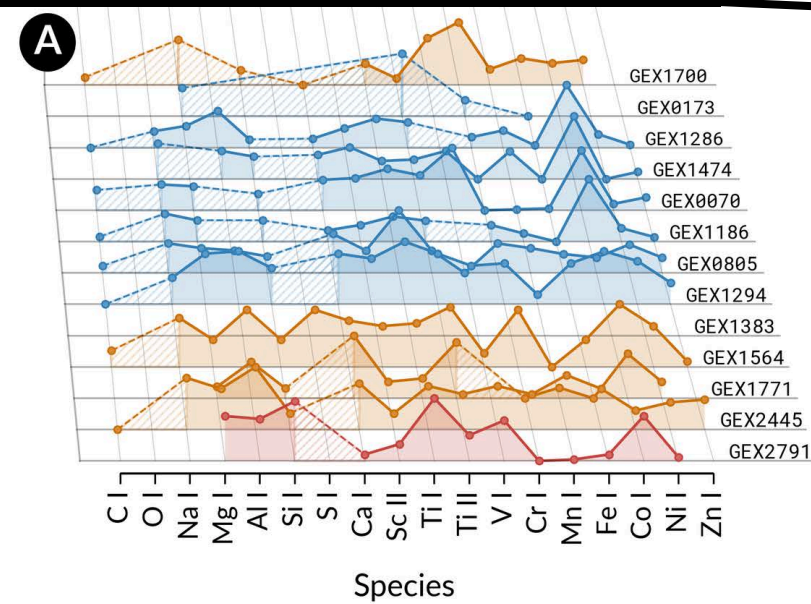
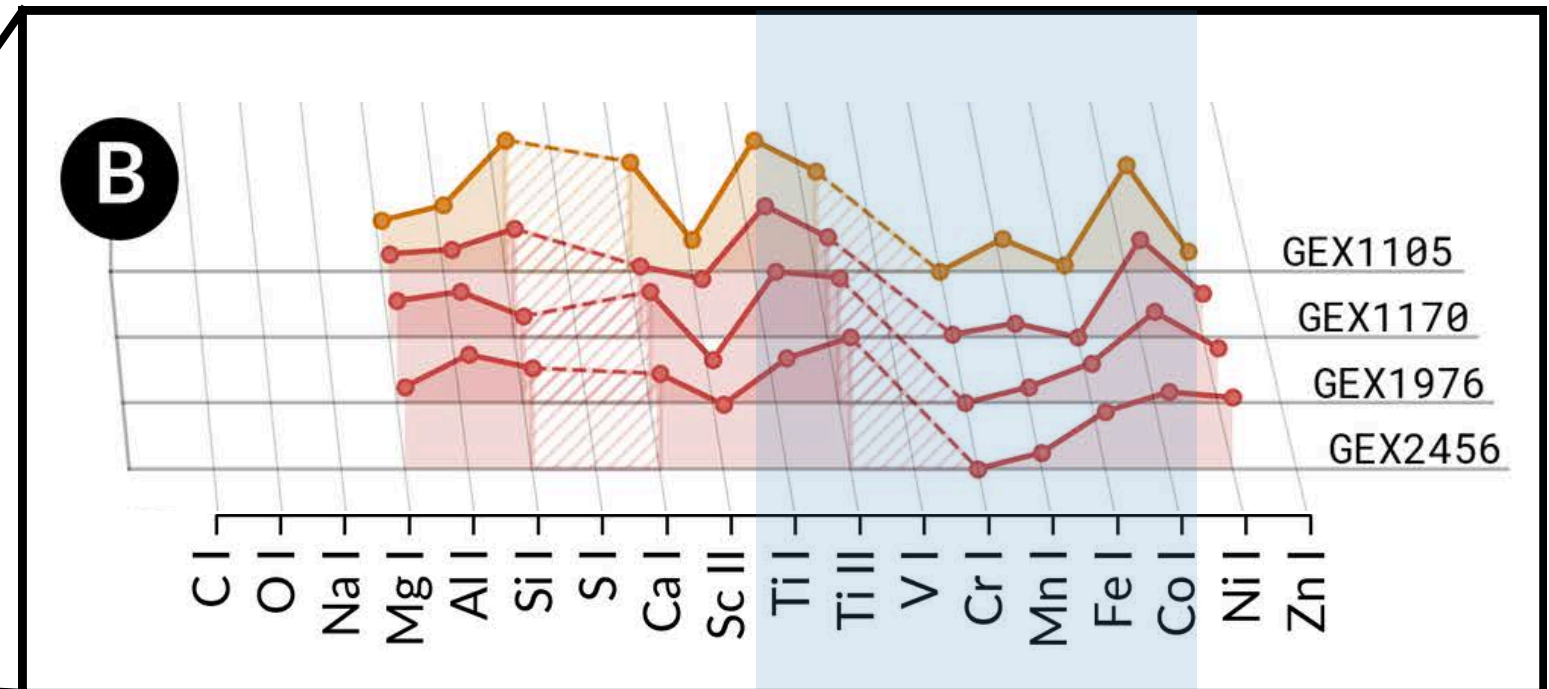
UV upturn is observed in the bulge of spiral galaxies
¿**Spatial link?**

Are they chemically different?



Despite the overlap between the groups on the plane, it appears that **G1 prefers the thick-disk regime**

A chemical fingerprint



▲ **Ti/Fe**

▼ **Cr/Fe, Mn/Fe**

▲ **Co/Fe**

An energetic origin?

- In core-collapse SNe:

High $T \rightarrow$ **Complete** Si burning = Fe, Co, Zn

Low $T \rightarrow$ **Incomplete** Si burning = Cr, Mn

- A higher explosion energy (e.g. **hypernovae**) provides:

More Complete Si burning

α -rich freeze-out

▲ Ti/Fe ▼ Cr/Fe, Mn/Fe ▲ Co/Fe

Consistent with the **chemical pattern** we identified!

So, can chemistry explain the UV?

Lower **Fe**-peak abundances → Less metal-line **blanketing** → More photospheric **UV** flux



Is this enough to explain the UV excess?

We don't know yet. It is unlikely to explain all of the UVX we observe



HST UV spectroscopy and future UV facilities (e.g. CASTOR, HWO, LOUVOIR), can help us answer these questions!

Take home message

- ◆ **Not a halo phenomenon**

T-GEX UV-excess stars are predominantly prograde and disk-like.

- ◆ **They carry a chemical fingerprint**

Extreme UVX stars show α -enhancement and hypernova-like Ti-Cr-Mn-Co-Ni patterns.

- ◆ **UVX traces old populations?**

Isochrones allow young stars, but chemistry and thick-disk membership favor older ages.

- ◆ **A possible link to galaxy-scale UVX**

Inner birth radii and rapid enrichment may connect resolved UVX stars to the UV upturn in galaxies.

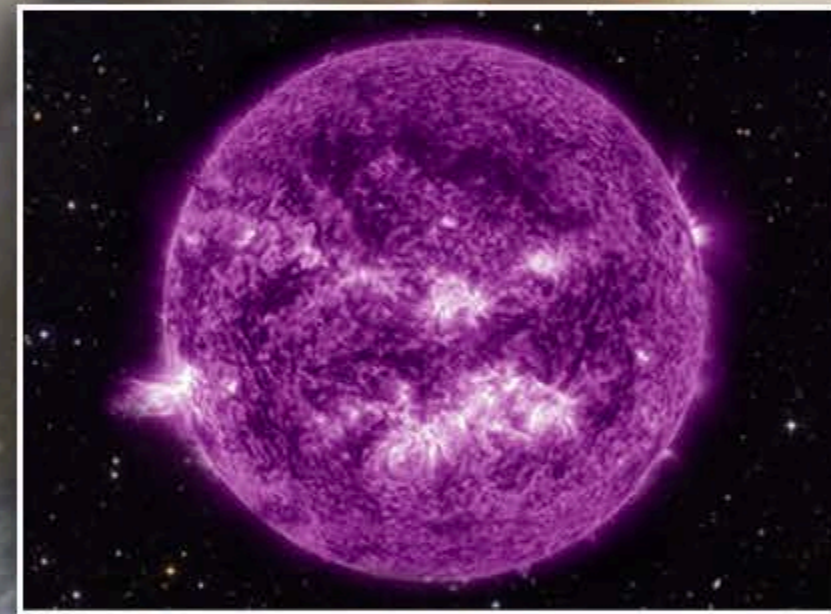
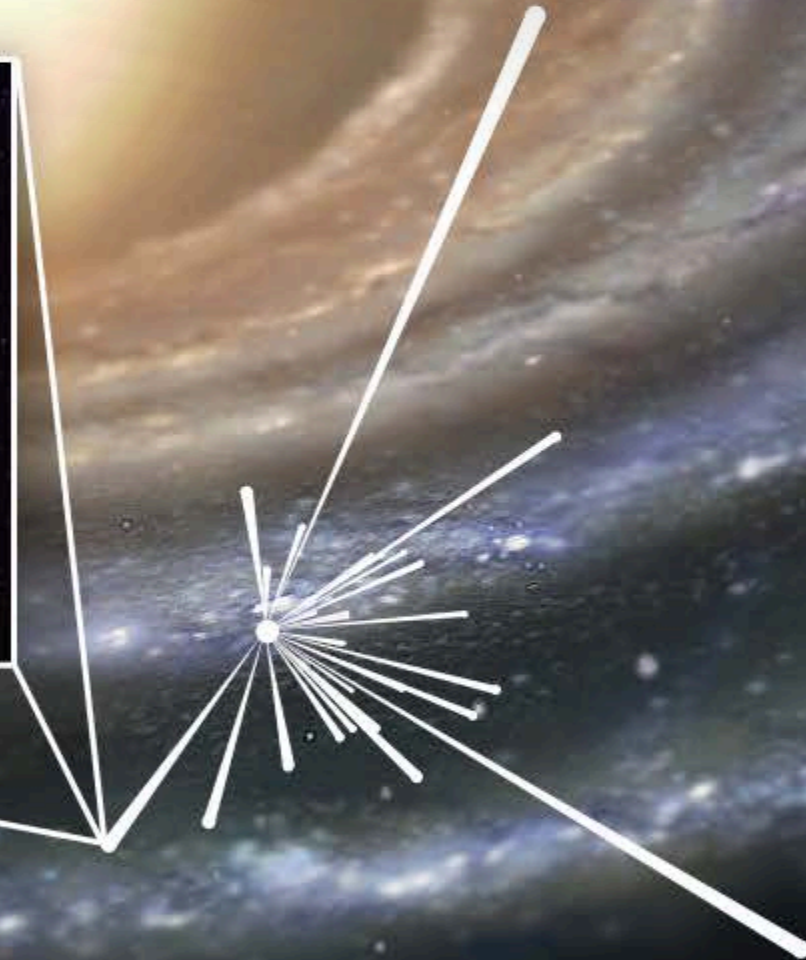
The UV excess is not a single story!



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DE CHILE



Thank you!



Diego Beltrán Flores

BSc in Astronomy
d_beltran@uc.cl

***Images:** Artistic representation of the MW (credit: Zheng & Reid BeSSeL/NJU/CFA)
+ Artistic representation of a UV-bright star (non-scientific)