

Tracing the evolution of young stellar population with the WST

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The formation of stars: open questions

Filaments



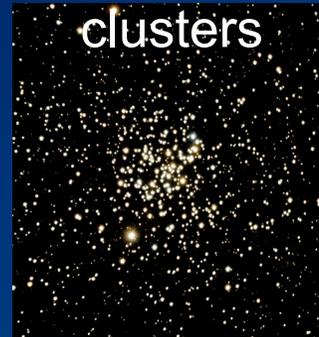
< 1 Myr



Stars and Gas



1-10 Myr

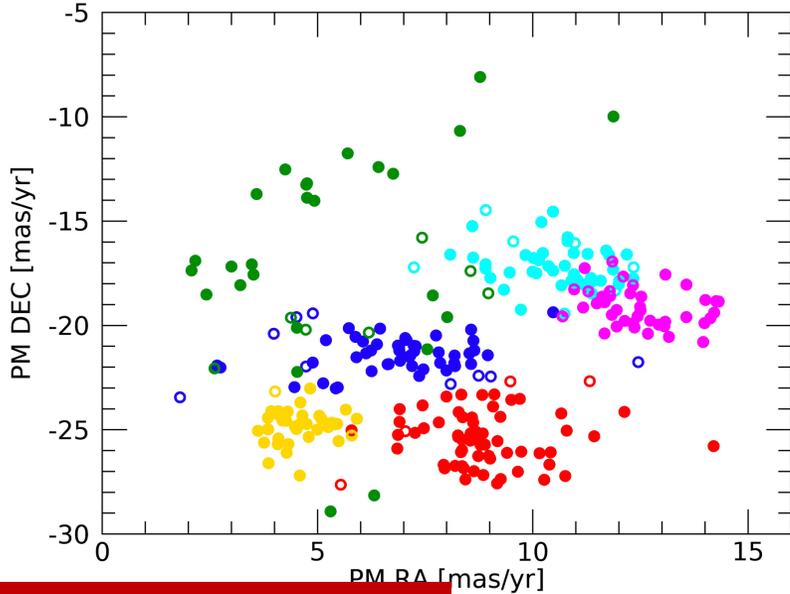


>100 Myr

1. Do all stars form in clusters ?
2. How do clusters disperse?
3. How does the SF environment influence the properties of stars and planetary systems?

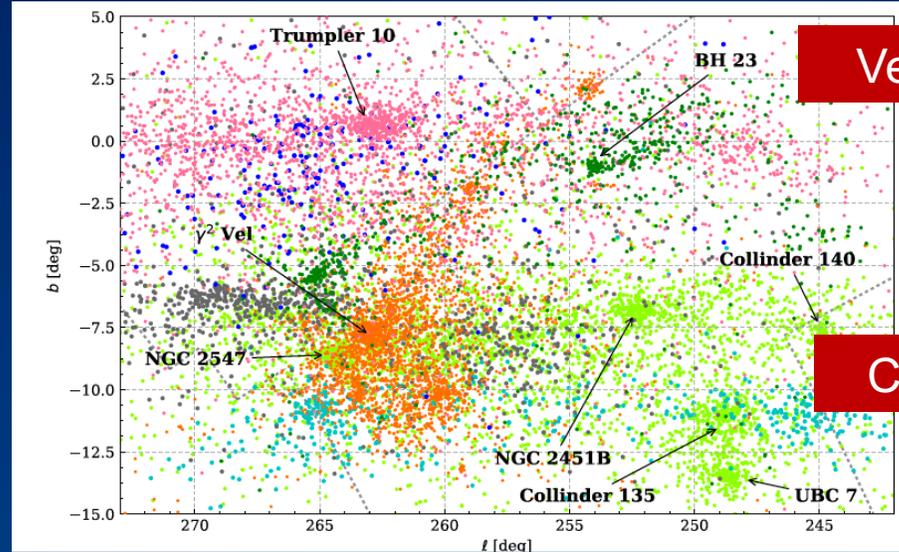
Results from Gaia and spectroscopic survey

Taurus



Roccatagliata+2020

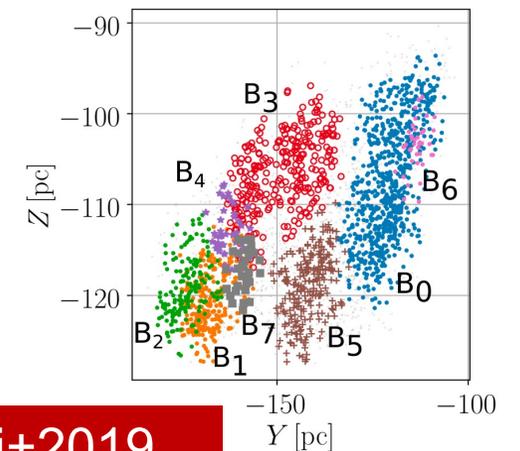
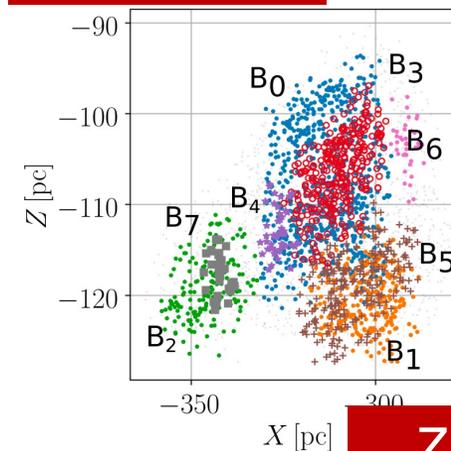
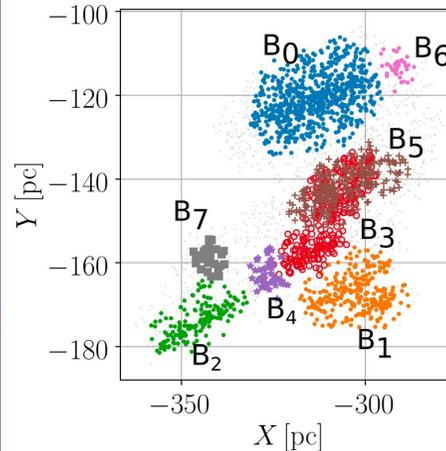
Star forming regions are composed of several multiple populations



Vela OB2

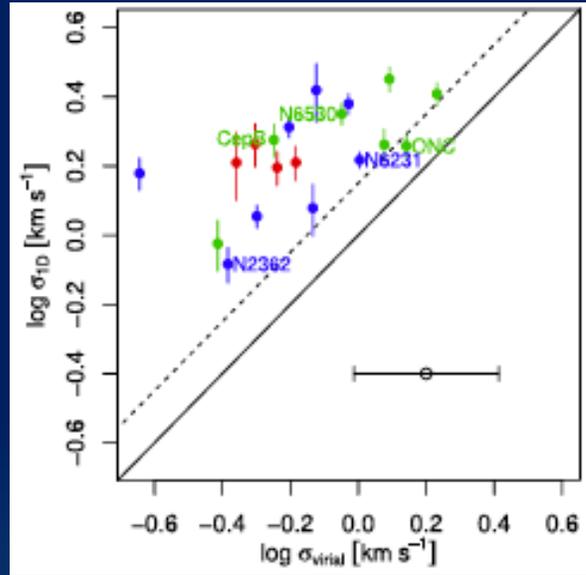
Cantat-Gaudin+2020

Orion

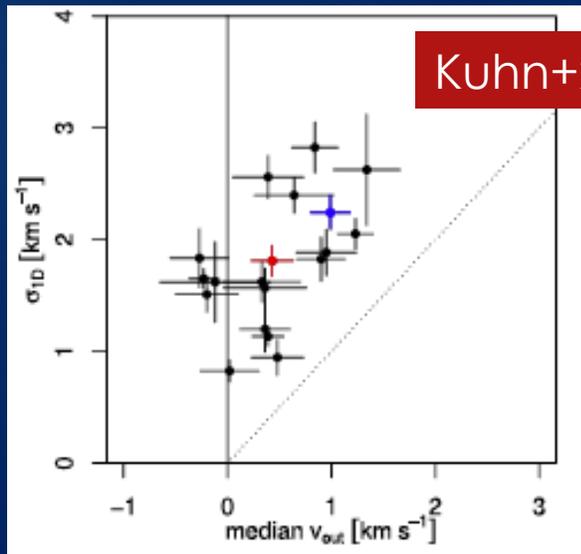
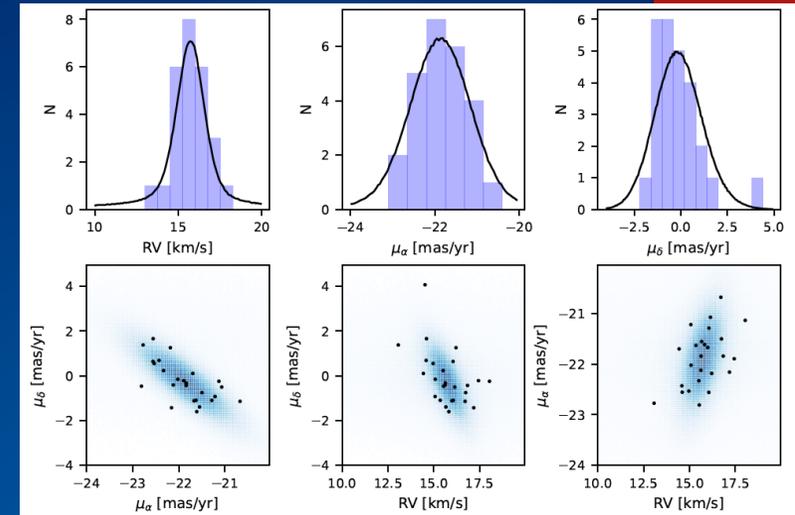


Zari+2019

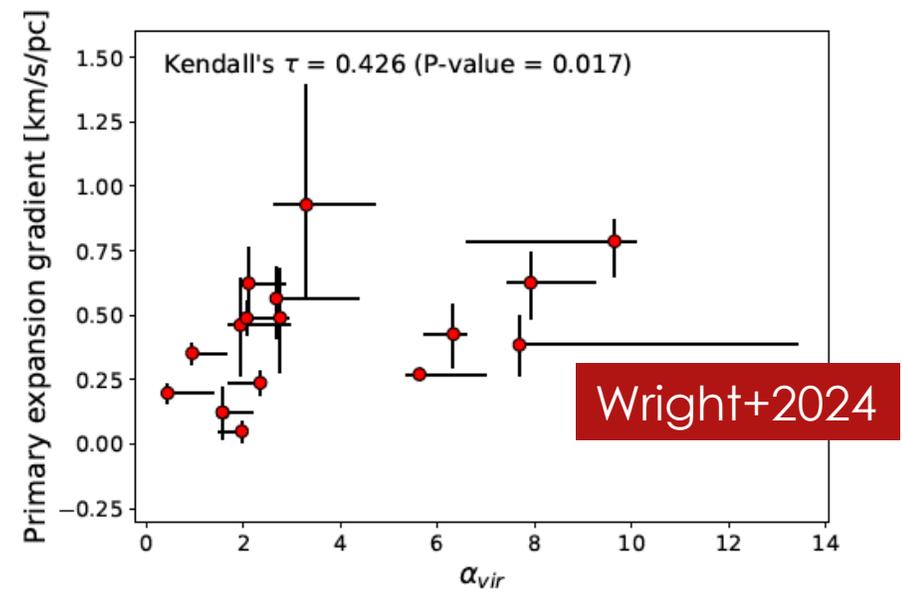
Results from Gaia and spectroscopic survey



Most YC are supervirial and expanding
(Bravi+2018, Kuhn+2019, Wright+2024)

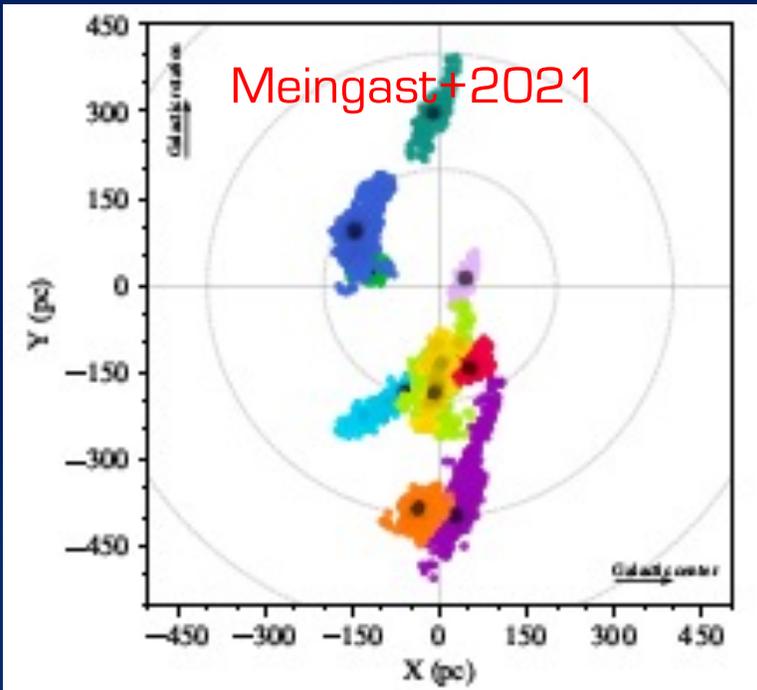


Kuhn+2019

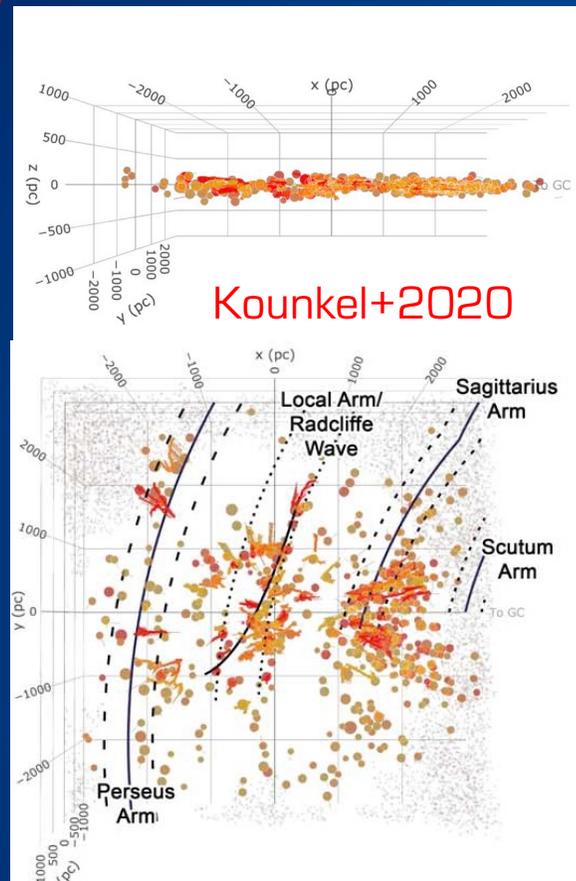
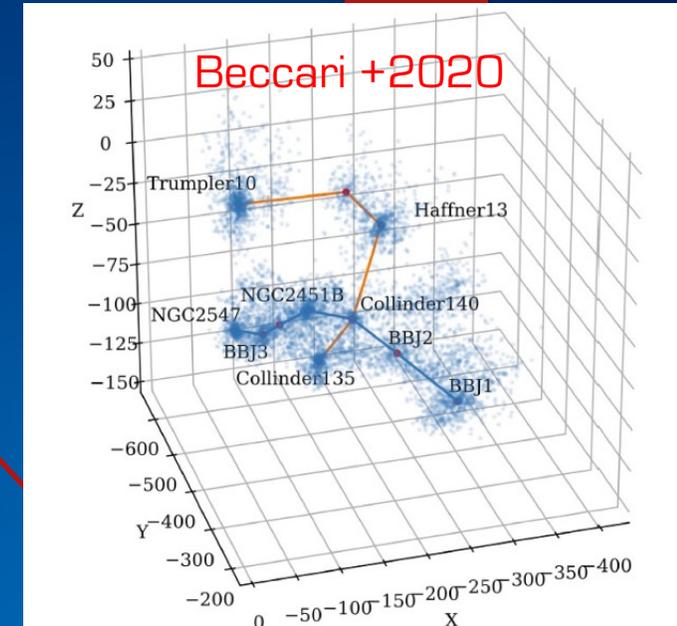


Wright+2024

Results from Gaia and spectroscopic survey



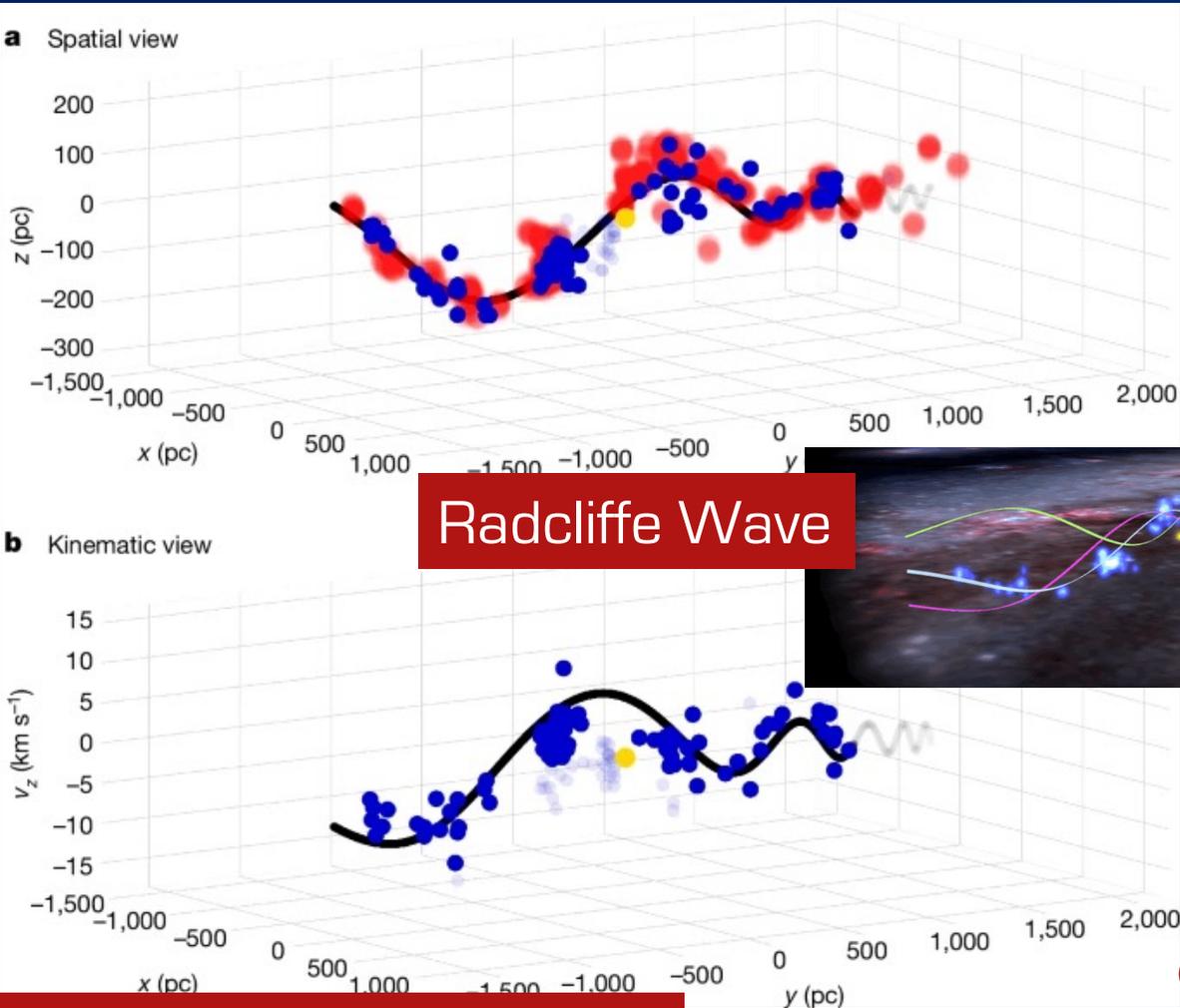
Gaia discovered new young dispersed stellar populations (Zari+2018, Kounkel+2019, 2020; Prisinzano+2022)



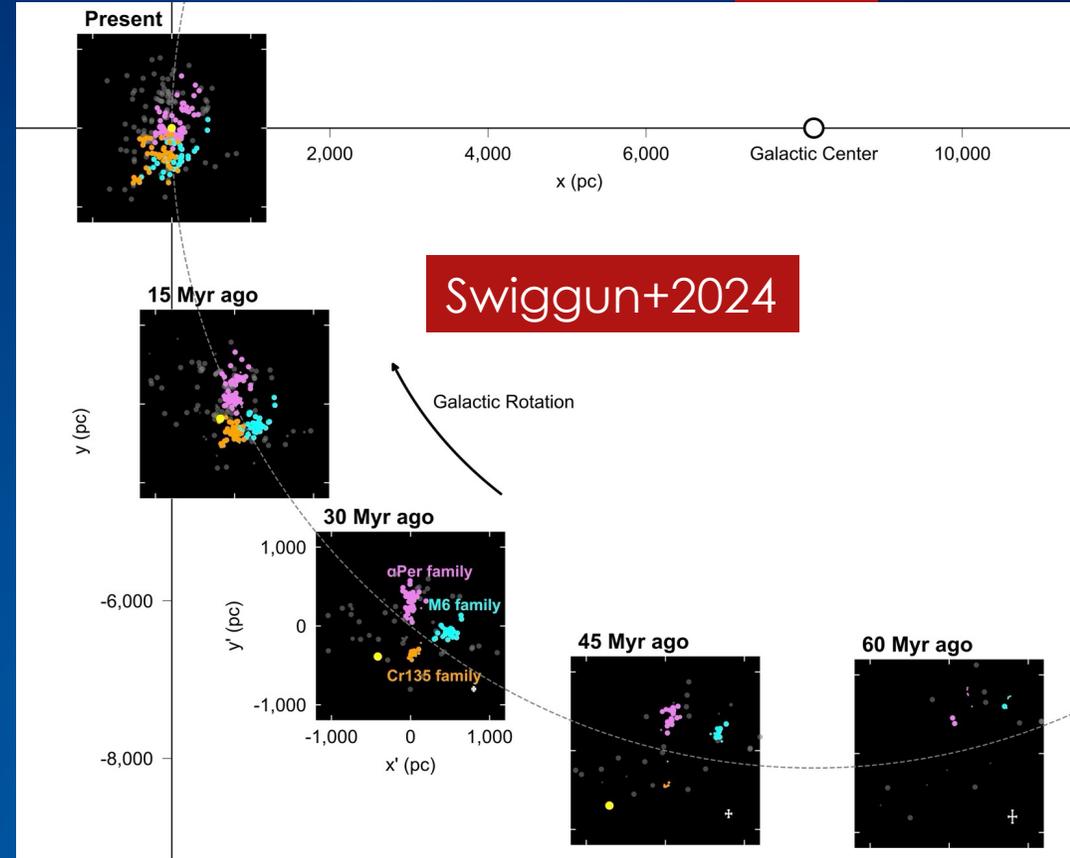
The results of clusters dispersion (e.g. Meingast+ 2021)

Star formation in low-density structures (e.g., Beccari+2020, Wright & Mamajek 2019)

Results from Gaia and spectroscopic survey



Alves+2020, Konietzka+2024



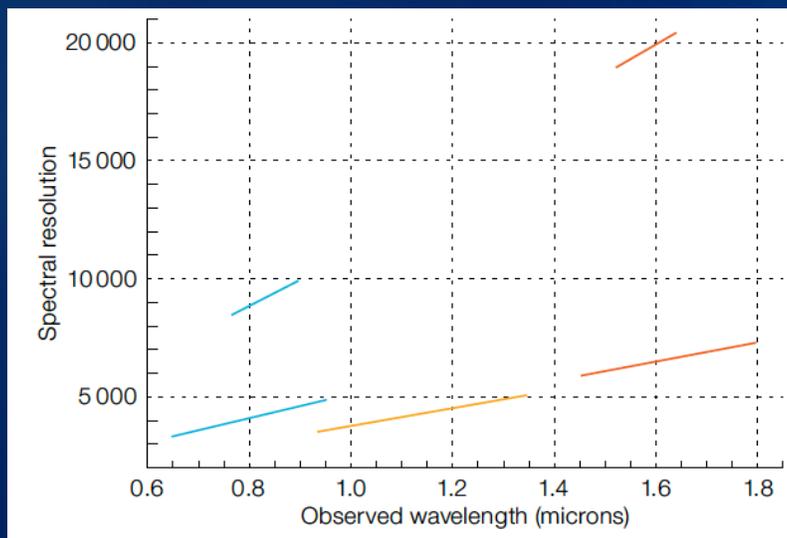
The star formation process around the sun can be associate to a few large scale structures

Spectroscopic survey of the next future



Spectroscopic survey of the next future: MOONS

Embedded or partially embedded cluster (age <2-3 Myr) at different galactocentric radii

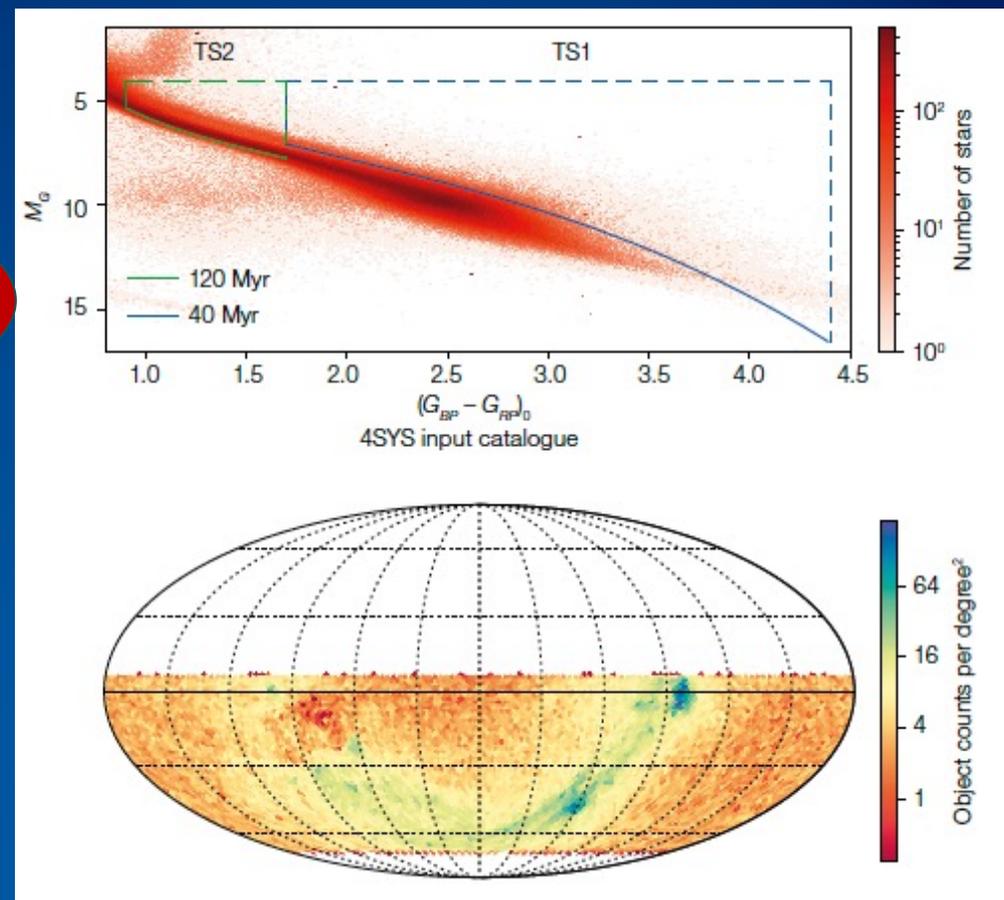
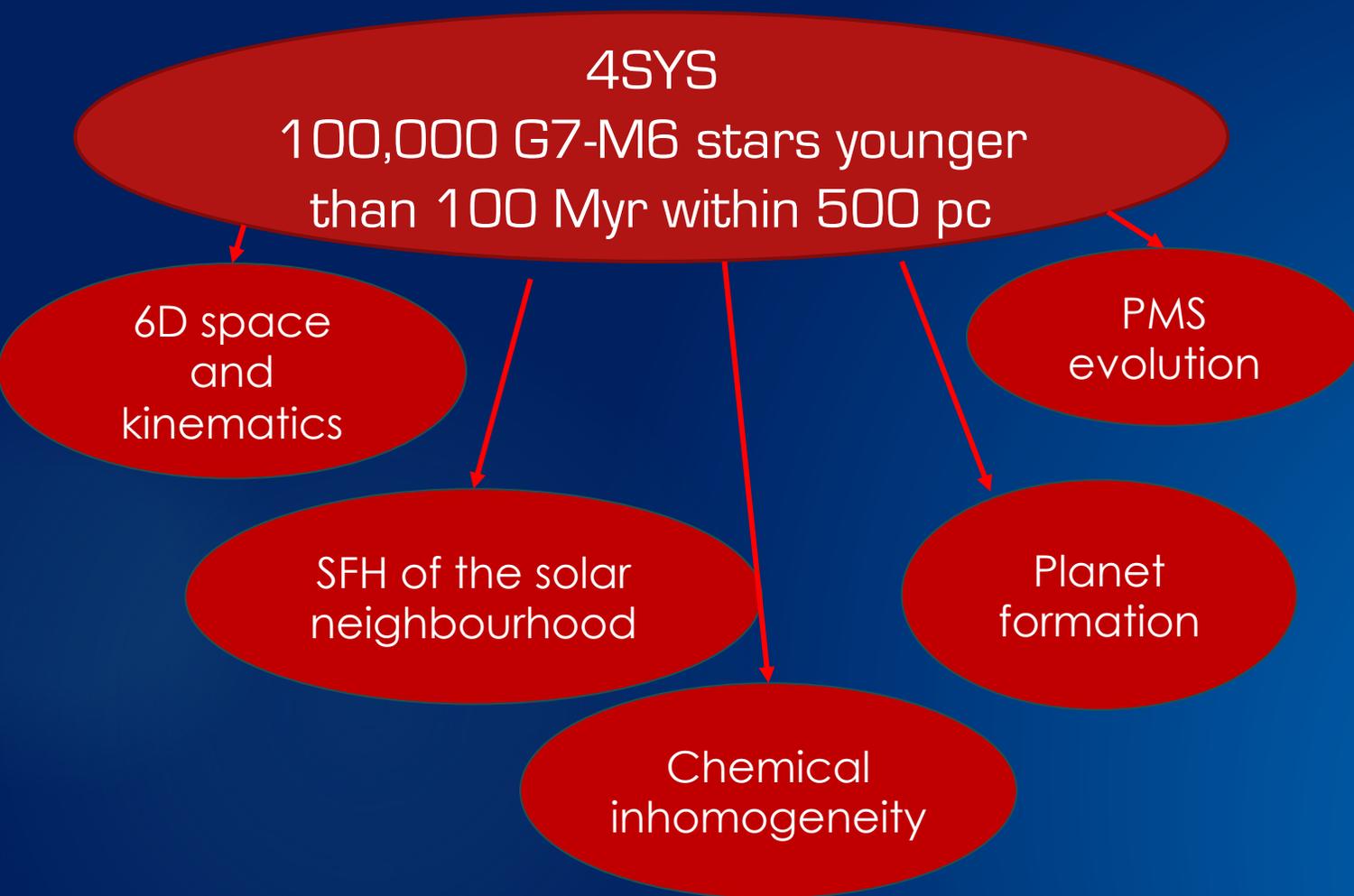


Kinematic of very young embedded populations

Accretion and outflows of protostars

Chemical gradients in very young clusters

Spectroscopic survey of the next future: 4MOST



[Sacco+ 2023]

WST surveys of young stars in the Galactic disc

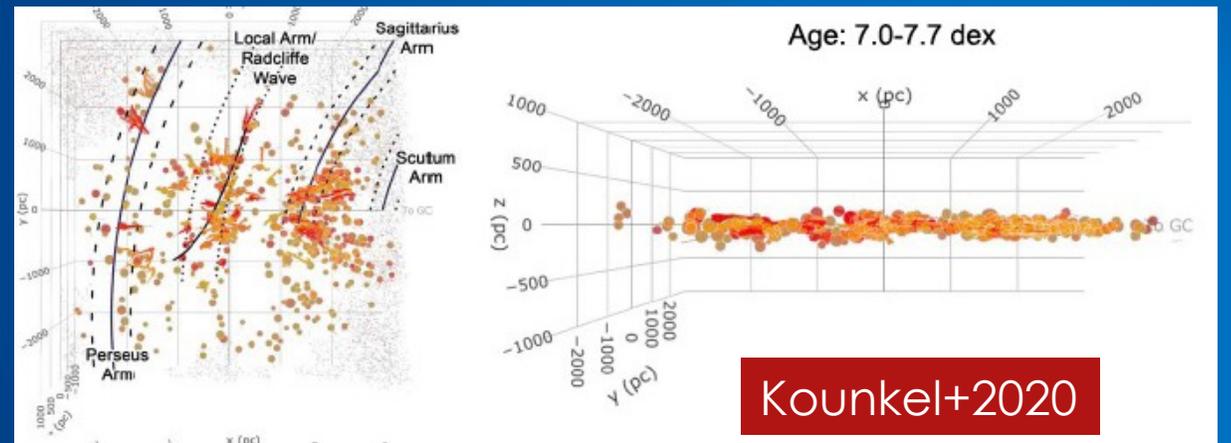
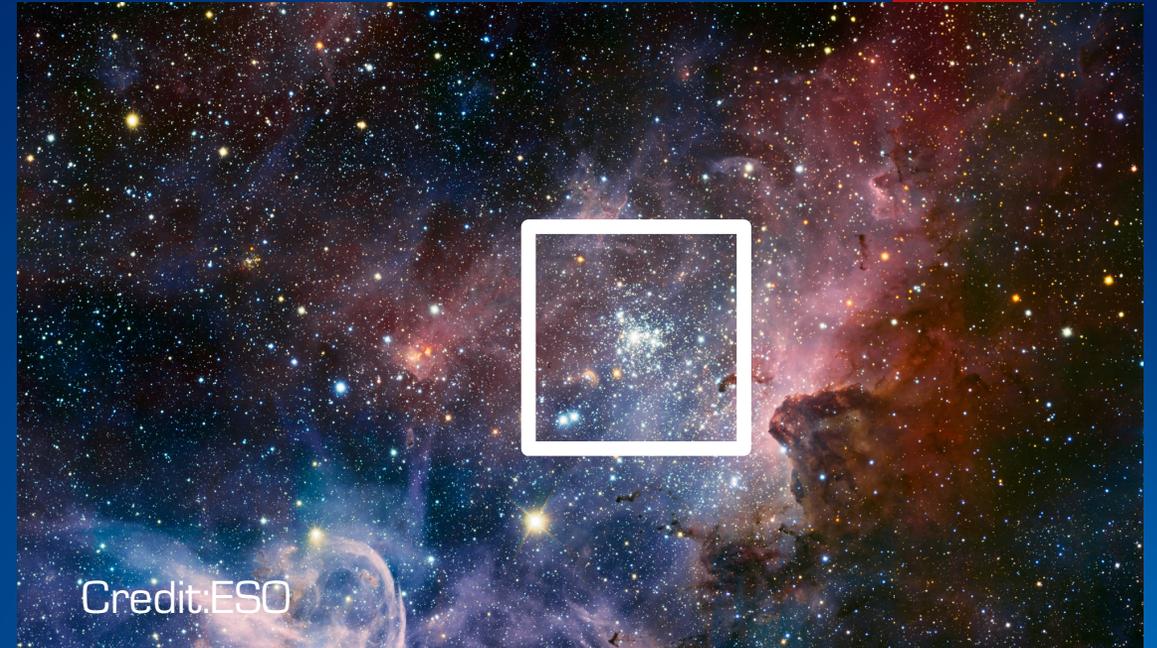
Goals

1. Evolution of massive star clusters
2. Large scale structure at galactic scale

Synergies : CTAO

Requirements

- $18 < G < 22$ mag
- Resolution 5000-20000
- It will benefit from infrared
- IFS (clusters)+fibers
- It will benefit from an extension in the NIR



WST surveys of young stars in the MC

Goal: Investigating star formation at different scales in a low metallicity environment.

Potential Synergies: SKAO

Requirements

- $G < 23$ mag
- Resolution 5000
- IFS (clusters)+fibers
- It will benefit from an extension in the NIR

