Project 1: What galaxies can we infer birth radii?
Stellar birth radii: Radial migration and birth radii

- Stars move away from their birth location overtime, infer abundance gradients of the ISM directly from mono-age population is incorrect

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Stellar birth radii: Radial migration and birth radii

- Stars move away from their birth location over time, infer abundance gradients of the ISM directly from mono-age population is incorrect.

Infer Birth radii requires a linear relation between ISM and R at all times.

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Stellar birth radii: Radial migration and birth radii

- Tool
  - NIHAYO-UHD Cosmological simulations (Buck+ 2018)
Q1: When do the assumptions hold in MW-like galaxies?

Pearson’s correlation coefficient (PCC) 

PCC = 0.7 
(50% variation accounted for)

Formation of the disk

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**Stellar birth radii**: Reliability in obtaining birth radii

Q1: When do the assumptions hold in MW-like galaxies?

**Figure**: Pearson’s correlation coefficient (PCC)

- True after the disk started to form
- Formation of the disk
- Formation of the bar

Lu+ 2022c

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Stellar birth radii: Reliability in obtaining birth radii
Project 2: Understanding stellar spin-down using Galactic kinematics
Stellar ages: Gyrochronology

Barns 2007
Stellar ages: Gyrochronology

Kepler (McQuillan+ 2014)

Things are not as simple as we thought!
Stellar ages: Using Jz as age proxy to understand stellar spin-down