How Galactic Chemical Evolution Influences the Distribution of Stellar Rotation Rates

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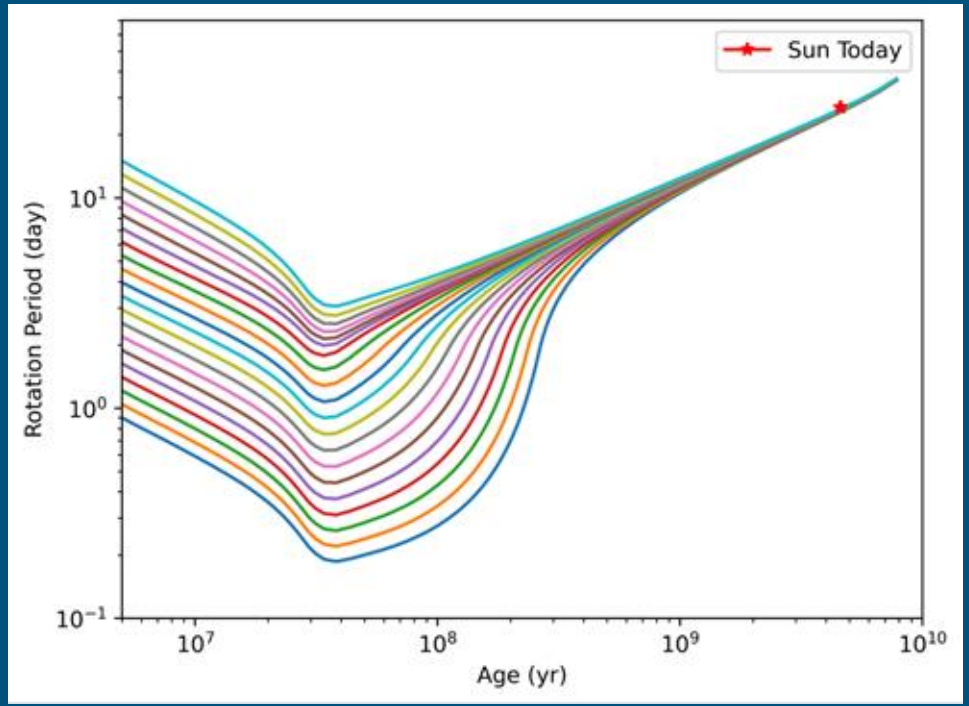
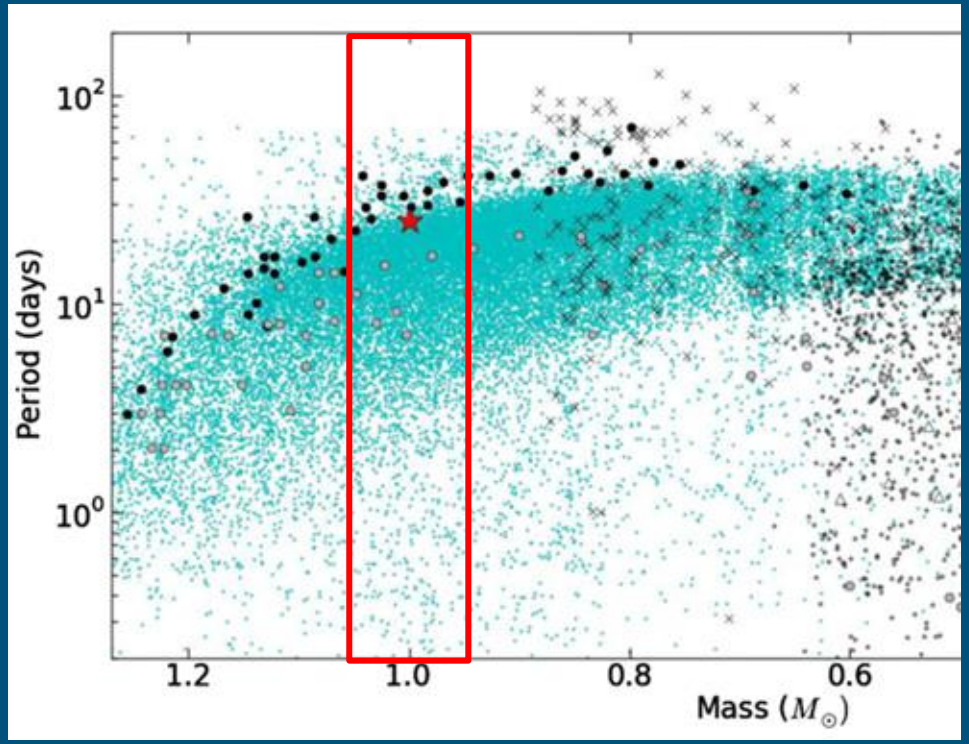
Rotation of Stars

- Stars rotate at different angular velocities which change over time
- During formation, rotation period decreases due to contraction
- During a star's life, rotation period increases due to stellar winds



The Problem: Missing Slow Rotators

- Sun is about halfway through its lifetime
- Half the stars should be older and thus rotating more slowly
- Where are the slow rotators?

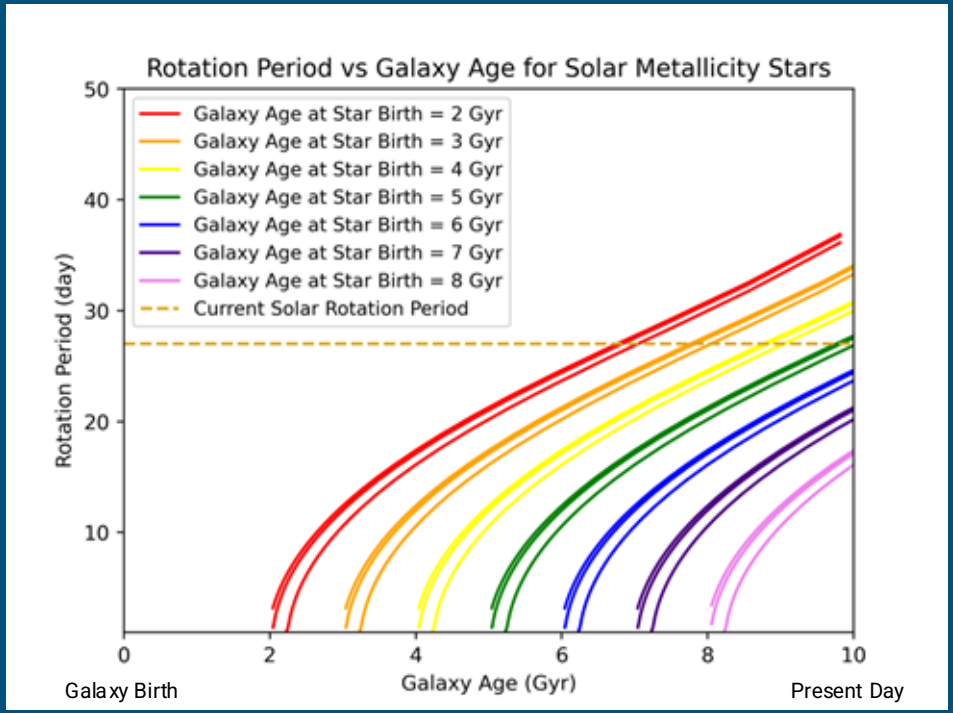


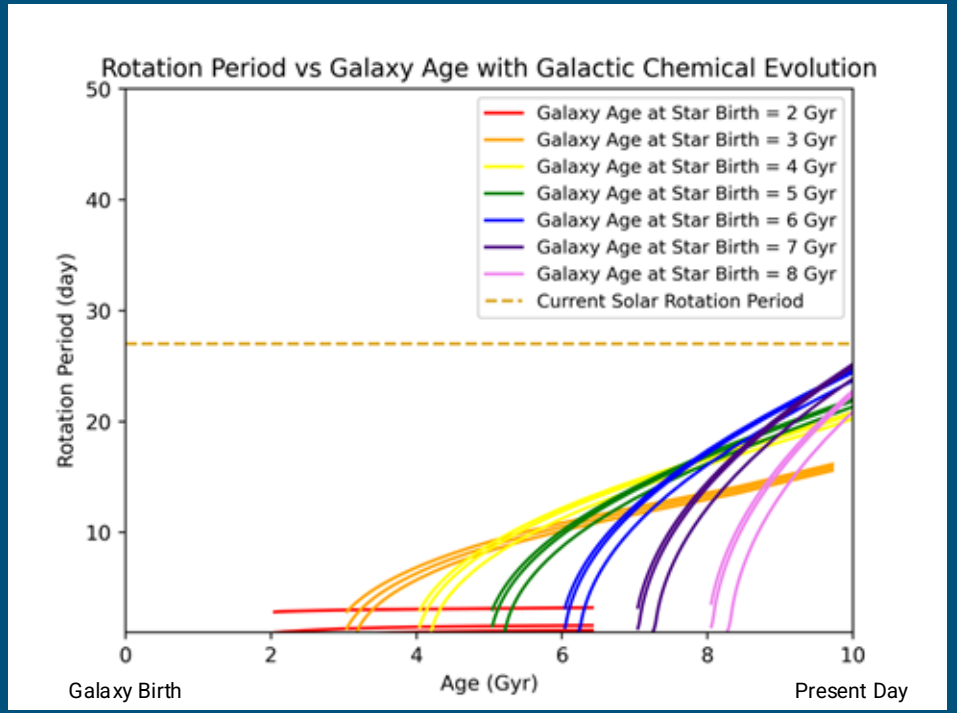
From Mcquillan et al., 2014
Red star is the Sun

Potential Solution: Metal Content

- Models predict that metal-rich stars spin down more effectively than metal-poor stars
- Stars create metals through nuclear fusion near the end of their lives
- Created metals enrich gas clouds that birth new stars
- Thus, younger stars are more metal rich and thus have spun down much more than older stars

Previous Results Look Promising





Overall Goal for the Summer

- Better model provided by Dr. Hayden
- Repeat the research with the better model
- Compare with observed data

Questions?