

DISCUSSION SESSION II

MODELING CHEMICAL

ENRICHMENT IN LOCAL GROUP

GALAXIES

THANK YOU, FRANCESCA!

(as a woman, as a scientist)

ISSUES

ISSUES

★ Stellar migration

ISSUES

★ Stellar migration

Pioneering work by Stromgren (1963, 1967)

Yuan's (1969) and Wielen's (1973, 1977) investigations

ISSUES

★ Stellar migration

THE ASTROPHYSICAL JOURNAL, 684: L79–L82, 2008 September 10

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RIDING THE SPIRAL WAVES: IMPLICATIONS OF STELLAR MIGRATION FOR THE PROPERTIES OF GALACTIC DISKS

ROK ROŠKAR,¹ VICTOR P. DEBATTISTA,² THOMAS R. QUINN,¹ GREGORY S. STINSON,³ AND JAMES WADSLEY³

Received 2008 July 9; accepted 2008 August 1; published 2008 August 13

ABSTRACT

Stars in disks of spiral galaxies are usually assumed to remain roughly at their birth radii. This assumption is built into decades of modeling of the evolution of stellar populations in our own Galaxy and in external systems. We present results from self-consistent high-resolution N -body + smooth particle hydrodynamics simulations of disk formation, in which stars migrate across significant galactocentric distances due to resonant scattering with transient spiral arms, while preserving their circular orbits. We investigate the implications of such migrations for observed stellar populations. Radial migration provides an explanation for the observed flatness and spread in the age-metallicity relation and the relative lack of metal-poor stars in the solar neighborhood. The presence of radial migration also prompts rethinking of interpretations of extragalactic stellar population data, especially for determinations of star formation histories.

Subject headings: galaxies: evolution — galaxies: spiral — galaxies: stellar content — Galaxy: stellar content — solar neighborhood — stellar dynamics

ISSUES

★ Stellar migration

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Subject headings: galaxies: evolution — galaxies: spiral — galaxies: stellar content —
Galaxy: stellar content — solar neighborhood — stellar dynamics

Roughly 50% of solar
neighbourhood stars have
come from elsewhere!!!

ISSUES

- ★ Stellar migration
- ★ Cosmological context

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- ★ Stellar migration
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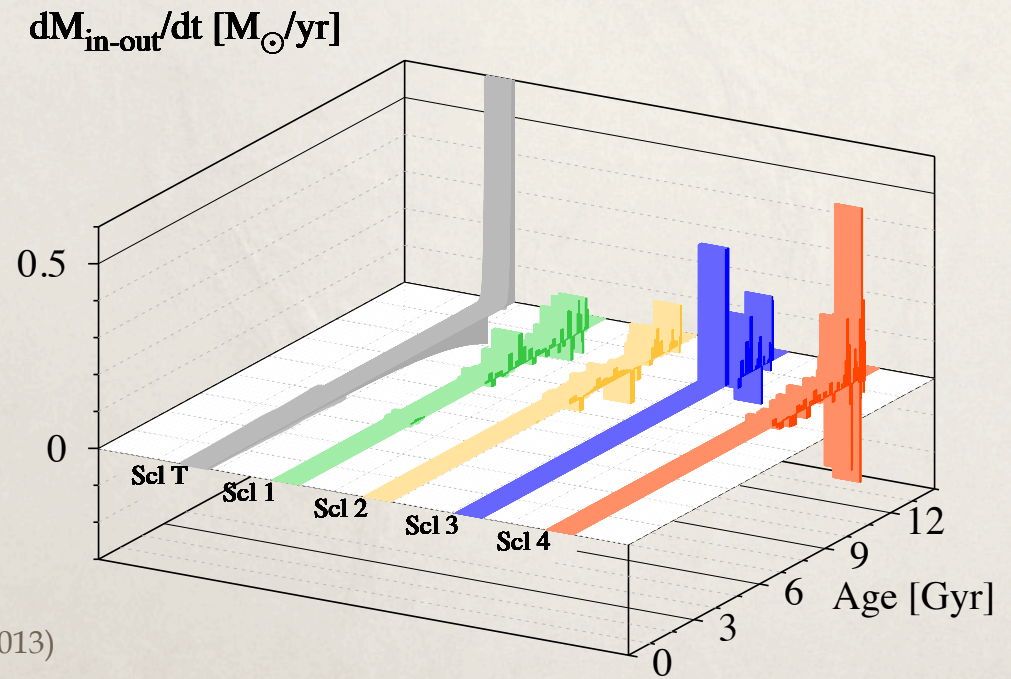


Figure and models from Romano & Starkeburg (2013)

ISSUES

- ★ Stellar migration
- ★ Cosmological context
- ★ Local inhomogeneities