

## Modeling Galactic Chemical Evolution

Carolyn Peruta Michigan State University

Collaborators: Brian O'Shea Jason Tumlinson

Tim Beers

JINA Frontiers October 23<sup>rd</sup>, 2010

# Objectives

- How does the chemical composition of our Galaxy vary as a function of time and location, and can we distinguish between different merger histories and stellar mass functions?
  - Develop sophisticated stellar feedback algorithm for cosmological simulations
  - Determine input parameter sensitivities and interdependencies
  - Verify and validate semi-analytic galactic chemical evolution models with cosmological simulations



- Evolve simple stellar populations (SSP) as single star particles
- Trace progressive nucleosynthetic enrichment from stellar feedback of ≤12 elements
  - Major coolants: C,N,O
  - Alpha elements: Mg, Ca, Ti
  - Iron peak elements: Fe, Co, Zn
  - Neutron capture elements: Sr, Ba, Eu
- Trace time release of kinetic energy and luminosity

## Available AGB and SNII Yields







#### Parameterizations of r-,p-process



Many models do not track heavy neutron capture isotopes

Temporary values:

Metallicity Dependent s-process yields for Sr, Ba from Travaglio et al. 2004

r-process yields from Wanajo & Ishimaru 2006 assuming a site of core-collapse SNe



### One zone SPP results: IMF study



#### Much more to come...

