** Proposal **

What: An outline of a proposal for an Aspen summer workshop.  
When: last two weeks of June, 2007.  (normally 2-3 weeks)  
Topic: The Physics of Stellar Yields and Chemical Evolution in the Universe  
Who: suppose to include about 30 people per week.

** People **

SOC (proposed):
Kim Venn (yes) - stellar populations (CAN)  
Vanessa Hill (yes) - stellar abundances (FR)  
Falk Herwig (yes) - AGB yields (US - soon UK)  
Corinne Charbonnel (yes) - RGB-AGB interiors, mixing, yields (FR)

** Topics **

1. Massive Stars and SN II yields.  
   - mass, metallicity, and other dependences  
   - alpha-element enrichment, r-process enrichments  
   - theoretical models and predicted yields from oxygen to uranium.  
   - rotating models  
2. Supernova Ia yields.  
   - theoretical models and predicted iron-peak yields  
   - binary evolution yields vs single object yields,  
   - SN Ia/ SN II rates  
3. AGB s-process yields.  
   - mass, metallicity, and other dependences  
   - theoretical models and predicted yields  
   - C13 pocket  
   - non-convective transport processes (rotation, internal gravity waves, magnetic fields)  
4. Stellar Observational Constraints.  
   - red giant abundances in metal-poor stars in the Galaxy.  
   - RGB abundances in dwarf galaxies  
   - AGB abundance changes during evolution  
   - Abundances in globular clusters  
   - CDM N-body models that include chemicals  
   - galaxy formation models that include chemicals  
   - galaxy evolution models that include chemicals

Topics not currently covered:  
a. first stars, EMPS  
b. planetary nebula
c. ISM gas/ IGM gas - chem ev with redshift
d. dust
e. binary mass transfer

** Proposed speakers and participants **

1. Massive Stars and SNII yields
   - Heger, Meynet, Limongi, Wanajo (+SOC Truran)
     (2nd round: Chieffi, Hirschi, Thielemann/Frolisch)
2. Supernova Ia yields.
   - Nomoto/Iwamoto, Thielemann, Woosley
3. AGB s-process yields.
   - Lattanzio, Travaglio, Siess (+SOC Herwig)
4. Stellar Observational Constraints
   - McWilliam, Smith, Barklem, Feltzing, Primas (+ SOC Venn & Hill)
     (2nd round: Bonifacio, Carretta/Gratton, Shetrone, Cuhna, Johnson, Ivans, Sneden, Fulbright, Rockosi)
5. Models of Chem Evol of Galaxies & the Universe - N-body with chemistry
   - Bullock, Brook, Fenner, Governato, Chiappini (+SOC Johnstone & Wyse)
     (2nd round: Gibson, Font, Tumlinson)

** Other meetings **

We have found two other meetings with some overlapping topics to the workshop proposed here, and know of one meeting that has been proposed for summer 2007;

1. IAU Symp. 241: Stellar Populations as Building Blocks of Galaxies, Canary Islands (December 2006)
   Sessions on stellar evolution, IMF, and chemical evolution (including chemodynamics, feedback and galactic winds, infall/outflows, hierachical formation framework).

2. From Stars to Galaxies: Building the pieces to build up the Universe, Venice (16-20 October 2006)


** Abstract ** revised 27 June 2006

As detailed abundances for stars become available from a variety of environments, it has become possible to test the fundamental assumptions of stellar nucleosynthesis. From analyses of r-process rich stars, we
know that there is a large variety in the sites for heavy element formation. From s-process abundance ratios in a variety of Galactic environments, we have learned that AGB yields depend on metallicity, mass, age. From the chemistry of stars in the dwarf galaxies, we are learning that the alpha-elements nucleosynthetic formation sites must vary slightly, and can confirm many of the r-process and s-process results found in the Galactic stars. Combining these new observational constraints with theoretical modelling is an exciting new and developing field. These observations are being used to constrain the physical processes underlying the predictions for the production of the elements (mass cuts in SN II, size of the 13C pocket in AGBs, time scales for stellar yields, effects of core overshooting, of rotation, and the influence of metallicity on all the above-mentioned). The timing is ideal for a workshop that brings together the observers and theorists interested in nucleosynthesis and chemical evolution. Stellar abundance analyses have been improved and expanded, theoretical models have also developed, and both are being used in N-body simulations of CDM galaxy formation. Bringing these groups together to discuss details of their analyses, important sources of uncertainty, the most accurate/valuable constraints, and future directions is timely and would be a lively workshop.