Session II

Chaired by Carla Froehlich

Kerstin Sonnabend - Open Questions in s- and p-processes

Kerstin Sonnabend (Goethe U): Open Questions in s- and p-processes #nucatown

Derek Fox

Sonnabend: Hence determination of neutron capture cross sections using spallation sources and nuclear reactions #NucATown

Derek Fox

Sonnabend: FRANZ accelerator at Goethe U - high-luminosity, adjustable energy range, activation and time-of-flight exp'ts possible #NucATown

Derek Fox

Sonnabend: Measuring half-lives in stellar-like conditions using beta+ and beta- decay in accelerator exp'ts #NucATown

Derek Fox

What's your favorite p-process candidate site? #NucATown

Nuc Astro Town 2012

Sonnabend: p-process: Dominant channel via photodisintegration; branching determines abundances; astrophysical sites debated. #NucATown

Derek Fox

#nucatown p,n for beta decay of excited states works only for transitions to the ground state. how many cases are there?

Hendrik Schatz

Sonnabend: Need to determine (gamma, p) and (gamma, alpha) reaction rates. Small cross sections - pursue activation method. #NucATown

Derek Fox

#nucatown (n,alpha) measurements, especially high-resolution ones, are very sensitive to alpha-optical potential at astrophysical energies.

Paul Koehler

For activation method by gamma rays, samples need to be on order of grams. For rare isotopes these are very expensive! #NucATown

daid kahl

Sonnabend Q: Are target radioactive samples hard to gather? A: Branching ratios not difficult (reactor n-capture), purity crucial #NucATown

Derek Fox

#NucATown how can we constrain p-process in GCE from observations?

Alexander Heger

Rebecca Surman - Open Questions in r- and vp-processes

Rebecca Surman (Union College, Notre Dame): Open Questions in r- and vp-processes #NucATown

Derek Fox

#NucAtown Rebecca Surman now talking about open questions in r- and nu-p-process nucleosynthesis

Christian D. Ott

#NucATown s-process branching points 1: if beta decay is not sensitive to T, then branching gives info about neutron density only

Marco Pignatari

#nucatown can grains constrain p process GCE?

Hendrik Schatz

#NucATown s-process branching points 2: if beta decay is sensitive to T and rho*ye, then direct info also about thermo-dymanic, convection..

Marco Pignatari

Surman: Most important question for astrophysicists: What is the astrophysical site of the r-process? #NucATown

Robert Rutledge

Surman: Nu-p process nicely explains Solar abundance anomalies at lower A. #NucATown

Derek Fox

Surman: Astrophysical site of the r-process probably key outstanding mystery of nuclear astrophysics. #NucATown

Derek Fox

@HendrikSchatz grains do not last more than ~ 1 Gyr in the interstellar medium #nucatown

Marco Pignatari

Surman: r-process - may need two astrophysical sites for lighter and heavier nuclei #NucATown

Derek Fox

#nucatown In the p-process it is important to go into radioactive nuclei, but also extend to heavier masses where very little data exists

Artemis Spyrou

(p,n) to constrain weak interaction matrix elements. low energy neutron det.: e.g. LENA@Debrecen/GSI,

LENDA@MSU, VANDLE@OAK RICH #NucATown

C_Langer

Surman: Experimental Q: properties of neutron-rich nuclei. Astrophysical Q: How have r-process abundances evolved with time? #NucATown

Derek Fox

#nucatown High accuracy (n,g) rates still needed for understanding s-process meteoric isotopic anomalies (96,97Mo, 86,87Sr...)

Paul Koehler

Surman: r-process candidates: core-collapse supernovae (multiple models), NS-NS mergers (good at high metallicity), GRB disks/jets #NucATown

Derek Fox

@Langer_Ch Don't forget WINDS@RIBF/RIKEN #NucATown

Shumpei Noji

#nucatown What energy resolution is needed in (p,n) expts in inv. kinematics for s-process? Is (p,n+gamma) required?

Remco

#nucatown Total neutron cross section measurements can constrain (n,g) on radionuclides, and they're much easier to measure than (n,g)

Paul Koehler

forum.astro.keele.ac.uk:808... #nugrid pre-release view of data #nucatown check "LEPP" species production in 5Msun models

Falk Herwig

When will be able to reach the isotopes along the r-process path? #NucATown

Karl Smith

New observations at high-resolution, to find additional highly r-process enhanced stars, now feasible to carry out #NucATown

Timothy Beers

@RemcoZegers cases where the (p,n) is stronger or comparable with (p,g) and/or (p,alpha)? #nucatown

Marco Pignatari

Surman: Properties of metastable nuclei, well within reach of exp't, important for establishing final r-process abundances. #NucATown

Derek Fox

#NucATown Obs. of r-process poor stars at low metallicities as important to understand contribution of nup-process to galactic abundances

Fernando Montes

@MarcoPignatari - was referring to using (p,n) to extract b-decay rates for s-process, not competition with (p,g)/(p,alpha) #nucatown

Remco

New r-process poor stars come "for free" when surveying for r-process enhanced stars, but require higher S/N followup #NucATown

Timothy Beers

#NucATown need to disentangle solar LEPP and stellar LEPP? Only one process feeding stellar LEPP? weak r is only one of the open options

Marco Pignatari

#nucatown alexakis et al. was a purely academic exercise.

Sumner Starrfield

@timothybeers #NucATown Observational bias if r-process-poor stars are found "for free"?

Fernando Montes

#nucatown nup-process=LEPP? seems unavoidable in core collapse SN?

Hendrik Schatz

No observational bias, since knowledge of r-process status unknown before conducting search, only

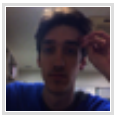
metallicity and temperature #NucATown

Timothy Beers

@HendrikSchatz if solar LEPP=stellar LEPP cannot be nup. If not, can be important, but together with other processes? #nucatown

Marco Pignatari

Jeff Blackmon - Explosive Hydrogen Burning

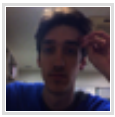


Jeff Blackmon (LSU) now speaking on Explosive Hydrogen Burning (e.g. novae, XRBs) at #NucATown

daid kahl

Blackmon: nuclear reaction rates are very important in these scenarios, see Parikh et al 2008: iopscience.iop.org/0067-004... #NucATown

daid kahl



Blackmon: Example of 25Al(p,g) rate which influences the observable 26Al in the galaxy. Some dozen indirect studies since last #NucATown

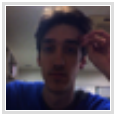
daid kahl

#nucatown you cannot measure every case: we need better theory to replase HF for these compound-like reactions.

f nunes

Existing low-E RIBs in Tokyo at CRIB: cns.s.u-tokyo.ac.jp/crib/cr... We welcome new collaborators (getting machine time is pretty easy)! #NucATown

daid kahl



Lunch time at #NucATown

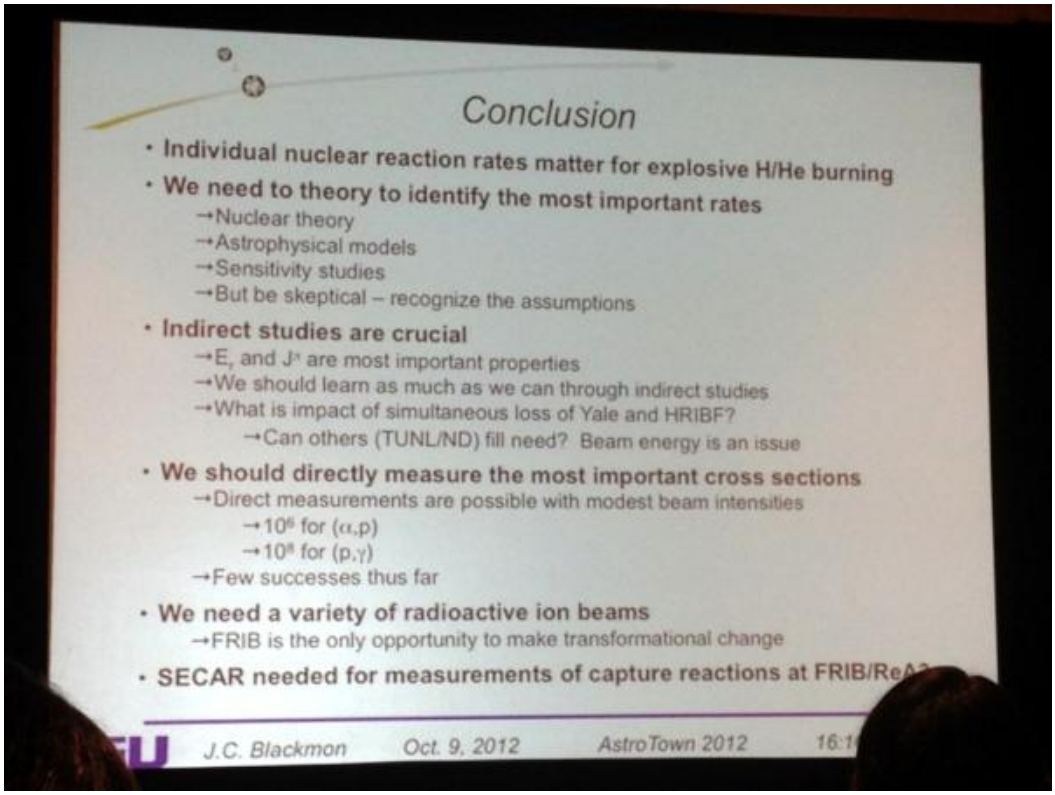
daid kahl

@MarcoPignatari @hendrikschatz Re LEPP - need to asses contributions of individual sites in framework that combines more than one

Falk Herwig

The morning session just finished 8 minutes early. #NeverBeenDoneBefore #NucATown

Robert Rutledge



Jeff Blackmon (LSU): Explosive Hydrogen Burning - conclusions (slide) #NucATown pic.twitter.com/x3cMDeKM

Derek Fox

A useful Strong force theory is the highest priority for nuclear physics. It is such a high priority, it is hardly ever mentioned. #NucATown

Robert Rutledge