

Nuclear Astrophysics Working Group

Conveners: Blackmon, Nollett, Schatz

Program

- Jim Truran: Astrophysics for the FRIB Era
- Science discussion

- Daniel Bazin: ISLA
- Bickley: AT-TPC
- Perdikakis: Weak rates
- Liddick: decay/CERDA
- Smith/Couder: direct (p,g)/SECAR
- Blackmon: direct (a,p)/ANASEN
- Rehm: indirect techniques/HELIOS
- Greife: indirect techniques/Gas Jet

- General discussion, including
 - priorities
 - special facility requirements (ReA12, ISOL, n-capture ?)

Nuclear Astrophysics Science Drivers

- What is the origin of the elements
 - r-process
 - vp-process
 - p-process
 - γ -ray emitters in supernovae: ^{44}Ti , ^{60}Fe
- What are the nuclear reactions that drive stars and stellar explosions
 - X-ray burst light curves and ashes
 - Novae
 - Weak interaction rates in core collapse and thermonuclear supernovae
- What is the nature of neutron stars?
 - Neutron matter EOS
 - Neutron star crust processes

Nuclear Astrophysics Equipment

- Nuclear Astrophysics uses fast, stopped, and reaccelerated beams.
- Wide range of equipment needed
- Use most of structure/reactions equipment
- Specialized equipment is needed
 - Recoil separator for ReA3 beams
 - other equipment is under development

Nuclear Astrophysics Facility Requirements

- Nuclear Astrophysics uses fast, stopped, and reaccelerated beams.
- For many experiments same requirements than structure/reactions
- Special requirements
 - High intensity ($>10^7$ pps) reaccelerated beams
 - ReA12 with ISLA ?
 - n-facility?
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