

# Science with decay spectroscopy

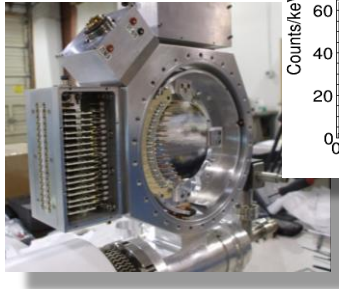
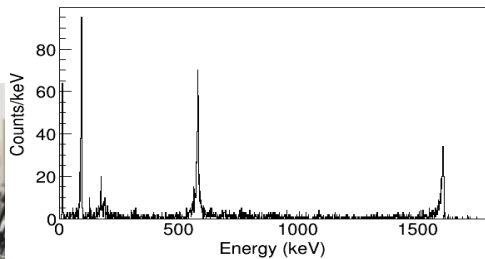
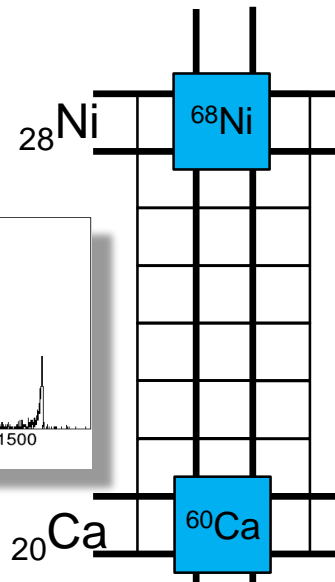
- Decay spectroscopy address multiple benchmarks

Overarching questions are answered by rare isotope research

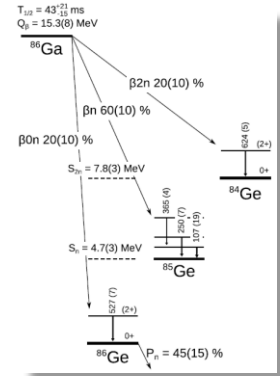
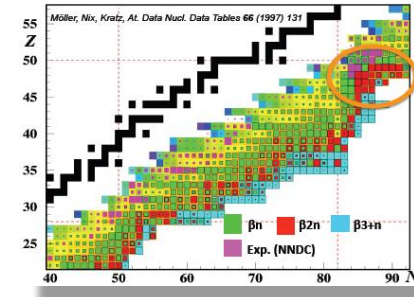
17 Benchmarks from NSAC RIB TF measure capability to perform rare-isotope research

1. Shell structure	●	6. Equation of State (EOS)		10. Medical	
2. Superheavies	●	7. r-Process	●	11. Stewardship	●
3. Skins	●	8. $^{15}\text{O}(\alpha, \gamma)$			
4. Pairing	●	9. $^{56}\text{Fe}$ s-process			
5. Symmetries	●	15. Mass surface	●		
13. Limits of stability	●	16. rp-Process	●		
14. Weakly bound nuclei	●	17. Weak interactions	●		
15. Mass surface	●				

N = 40

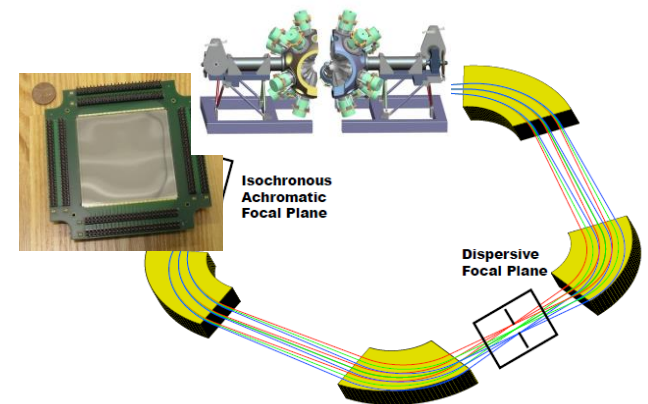


- Delayed neutrons



- Low production rate, unique decay modes.

- High-efficiency decay tag



# New Decay Spectroscopy Station

- FRIB Decay Spectroscopy Group
- Next generation decay spectroscopy array. Modular combination of detector types tailored to experimental requirements.
  - Implantation detectors of Si, Ge, or scintillators.
  - Photon detection for high resolution or high efficiency (HPGe, LaBr<sub>3</sub>, ...).
  - Neutron detection, <sup>3</sup>He, scintillators..
- Build on experience with existing prototypes.
- Flexible decay station
  - Stand-alone decay spectroscopy.
  - High-efficiency recoil decay tagging behind separators
  - Comensual operation.

