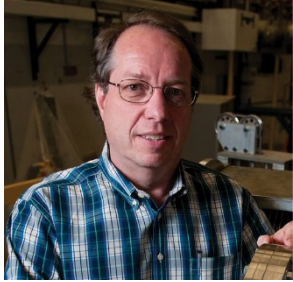


# Matching and Catching Unusual Isotopes



Dr. David J. Morrissey, University Distinguished Professor  
Department of Chemistry and NSCL, Michigan State University

The process of fragmenting very fast beams of heavy ions was identified almost forty years ago and it almost immediately recognized as way to produce and separate a very wide range of isotopes. [1] The production and rapid separation of reaction products by purely physical means is a mature field [2] and is the basis of operation of leading facilities around the world. [3] While nuclear structure studies have prospered using the fast exotic beams, there are a variety of experimental techniques that require ion beams with precise and or very low energies. The development of new techniques to slow and thermalize projectile fragments has been pioneered at the NSCL [cf. 4 for most recent work] and has enabled successful programs in precision mass measurements [5] and collinear laser spectroscopy. [6] A new frontier being explored in collaborative studies at the NSCL is the collection of longer-lived unused projectile fragments for off-line studies. [7] An overview of the variety of issues in the production and collection of projectile fragments will be presented.

References:

1. e.g., Viyogi, et al., Phys. Rev. Lett. 42 (1979) 33, Westfall, et al. Phys. Rev. Lett. 43 (1979) 1859
2. Morrissey, et al., Nucl. Instrum. Meth. **B 204** (2003) 970
3. Morrissey and Sherrill, Lecture Notes in Physics **651** (2004) 113
4. e.g., Cooper, et al., Nucl. Instrum. Meth. **A 763** (2014) 543
5. e.g., Gulyuz, et al., Phys. Rev. Lett. 116 (2016) 012502
6. e.g., Rossi, et al., Phys. Rev. C 92 (2015) 014305
7. Mastren, et al., Nature/Scientific Research 4 (2014) 6706

Wednesday

November 16

4:00 P.M.

Rm 118 NSH

Refreshments  
in Rm 202 NSH  
@ 3:30 pm