ISOL Beams

The following order is not by priority. Substitutions of specific beams can be made if the same physics is addressed. Generally, farther from stability beams than listed are desirable if possible. For the long isotope chains some selection of specific isotopes is recommended.

The list is essentially a summary of beams and topics given in Table I of the Nov. 1997 ISOL White Paper with some additions and simplifications.

Topic	Beam/Stopped Nuclei	Experiments/Notes
Near neutron dripline studies	^{11}Li, ^{29}Ne, ^{31}Na	Fusion, one and two nucleon transfer
Studies of N=Z nuclei from Ni to Sn and heavier proton dripline Nuclei	^{56}Ni, ^{62}Ga, ^{64}Ge, ^{68}Ge, ^{67}As, ^{72}Kr, as heavy N=Z as possible up to ^{100}Sn	Transfer, fusion, decay studies
Fundamental Studies Ion trapping	^{A}Fr	Trapped ions (10^{11}/s for trapping); as wide a range as possible
Heavy element studies	$^{50-52}$Ca, ^{72}Ni, ^{84}Ge, ^{96}Kr (possibly beams of Mn, or Ga could be substituted for Ni or Ge)	Fusion reactions
Study of n-rich nuclei	Same as heavy element studies, and $^{140-148}$Xe, $^{142-150}$Cs, ^{142}I, (heavier isotopes if possible)	Fusion, transfer and deeply inelastic reactions
Doubly Magic Nuclei and effective interactions	^{100,132}Sn, and neighbor nuclei	Transfer reactions, decay studies
Evolution of structure	3-4 long isotope chains: a) magic b) near magic c) far from magic; either one even Z element from Nd to Hf, or Kr d) any one medium or heavy mass odd Z (for decay studies)	Coulomb excitation, decay studies, transfer reactions, mass measurements

	e) light elements Na and K isotopes as heavy as possible	
r-process decay studies	$>^{114}$Ru, $>^{120}$Pd, ^{130}Cd, ^{126}Ru, $>^{150}$Ba, $>^{155}$Pr, ^{192}Dy, ^{190}Gd	Decay studies, half-lives, masses
r-process	^{130}Cd, ^{132}Sn, ^{142}I	Transfer reactions

Notes: The key words listed under the "Experiments" column give an indication of the need beam intensities. The available beam intensities should match the desired experiments. As a guideline, decay studies need 1-10/s, and require 100/s for coincidence measurements; Coulomb excitation will require 100/s with more detail possible with higher intensity; direct reactions require 10^4/s for easy cases and 10^6 for more detail or small spectroscopic factors and 10^8 for finely detailed studies necessary for study of effective interactions; fusion studies require 10^{6-9}/s; deeply inelastic reaction require 100/s to 10^7 since production cross sections are variable.