Summary

* Mass measurements of exotic nuclei at the ESR for nuclear-structure investigations and understanding of forces and nuclear many-body problems

* Unique combination of a Fragment Separator and a Storage and Cooler Ring

* Schottky Mass Spectrometry (SMS):
  cooled beams, time-resolved Schottky spectroscopy
  sensitivity: single ions
  accessible half-lives: $T_{1/2} > 1$ s
  mass resolving power: $R = 700.000$
  mass accuracy: $\delta m = 20...100$ keV $= 1...5 * 10^{-7}$
  more than 200 new masses in only 2 runs

* Isochronous Mass Spectrometry (IMS):
  first successful tests
  hot beams, tof-pickup detector
  sensitivity: single ions
  accessible half-lives: $T_{1/2} > 1$ μs
  mass resolving power: $R = 100.000$
  mass accuracy: $\delta m = 50...150$ keV $= 1...3 * 10^{-6}$

* New experimental techniques ideally suited to study gross properties of exotic nuclei
* Well suited to map large mass areas

* Outlook:
  stochastic precooling
  fission fragments with IMS