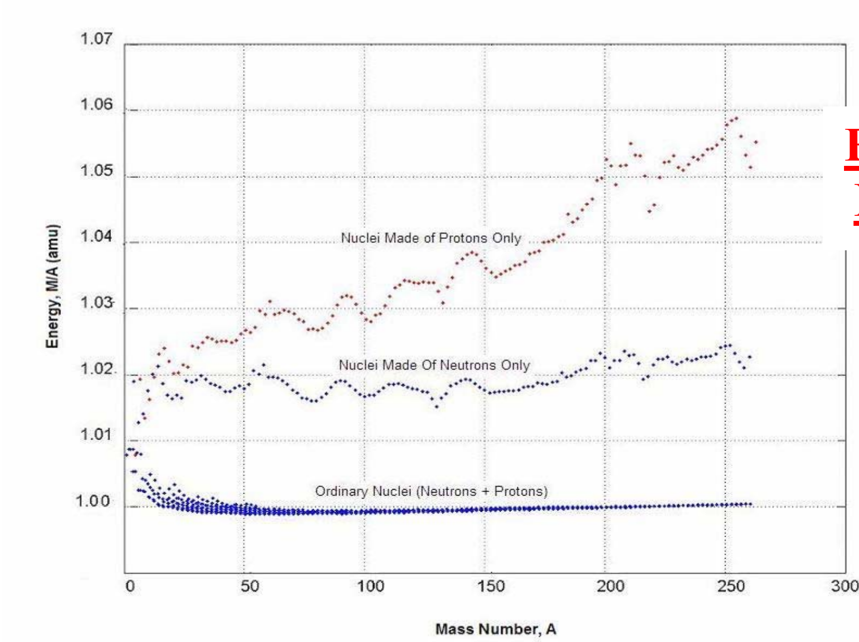
Ordinary Nuclear Matter and Nuclear Matter at Z/A = 0 and Z/A = 1.0



Energy Levels

Neutron emission from a neutron star generates ≈ 2 times the energy released in $^{1}H \rightarrow {}^{4}He \rightarrow {}^{56}Fe$

Sources of Solar Energy (SE) [19, 20]:

- Neutron emission from the solar core (>57% SE)
  $<{}_0^1n> \rightarrow {}_0^1n + \sim 10\text{-}22$ MeV
- Neutron decay or capture (<5% SE)
  ${}_0^1n \rightarrow {}_1^1H^+ + e^- + \text{anti-}\nu + 0.782$ MeV
- Fusion and upward migration of H^+ (<38% SE)
  $4\ {}_1^1H^+ + 2\ e^- \rightarrow {}_2^4He^{++} + 2\ \nu + 27$ MeV
- Escape of excess H^+ in the solar wind (100% SW)
  Each year 3×10^{43} $H^+ \rightarrow$ Depart in the solar wind

Neutron-emission releases **1.1% - 2.4%** of the nuclear rest mass as energy. Hydrogen-fusion releases **0.7%** if the end product is helium, and fission releases **0.1%** of the rest mass as energy [20].