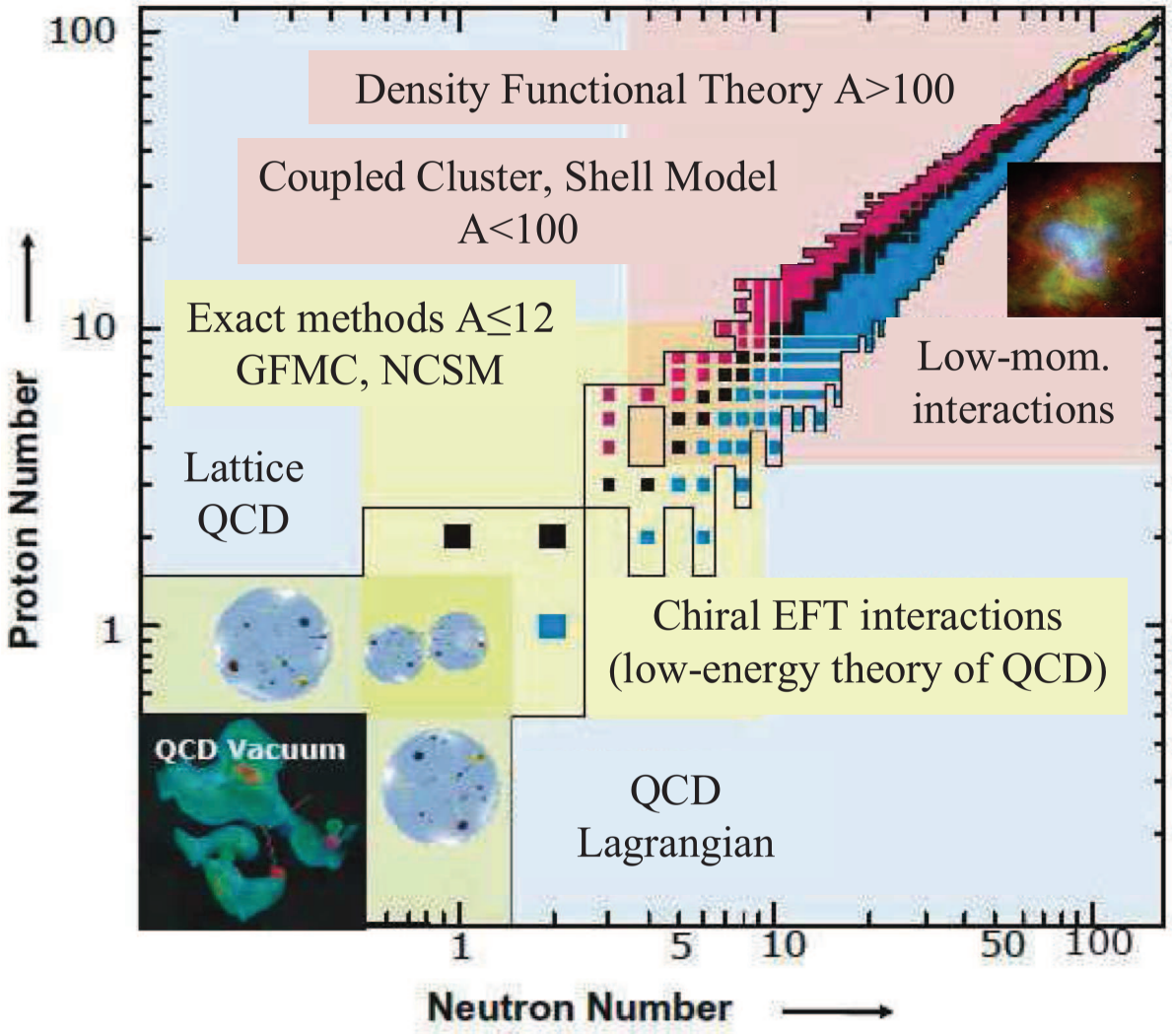
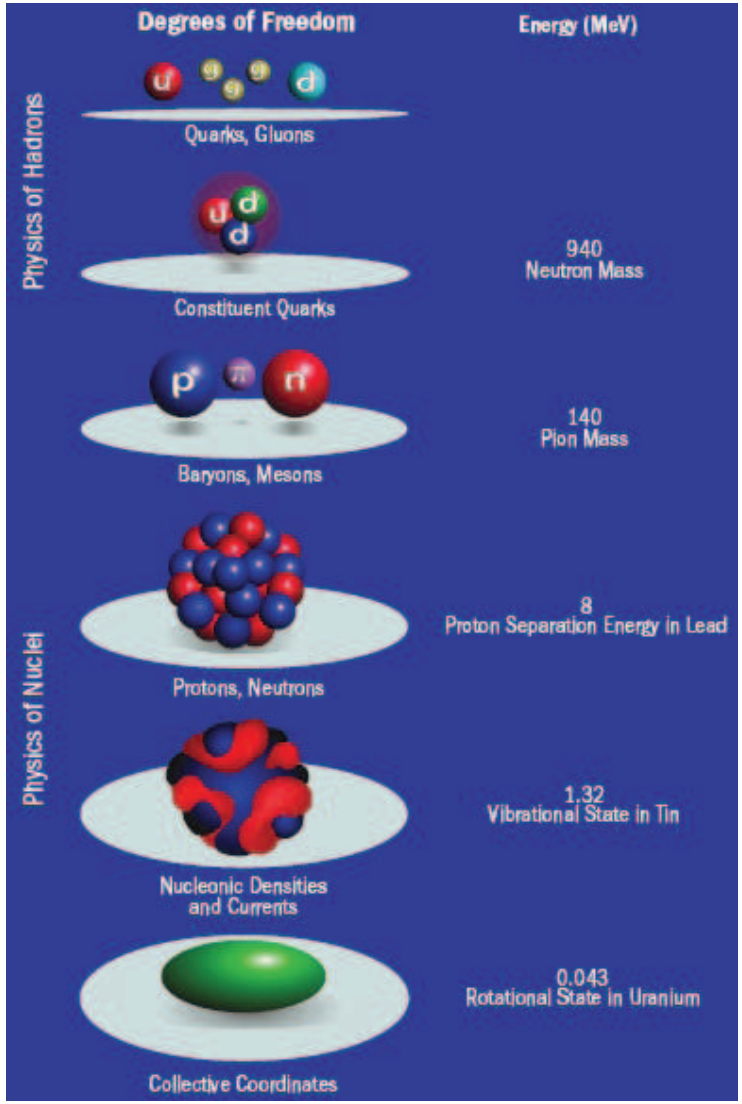
Degrees of Freedom: From QCD to Nuclei





- Renormalization Group $\Longrightarrow$ focus on relevant dof's

S. Weinberg on the Renormalization Group

- From "Why the Renormalization Group is a Good Thing"

  "The method in its most general form can I think be understood as a way to arrange in various theories that the degrees of freedom that you're talking about are the relevant degrees of freedom for the problem at hand."

- Universality in critical phenomena
  - Integrate out short-distance degrees of freedom
- Perturbation theory in high-energy physics
  - Gell-Mann–Low running coupling suppress low-energy dof's when calculating light-by-light scattering at 100 Gev
  - In general, shift between couplings and loop integrals
- Simplifying nuclear structure calculations
  - Make nuclear physics look more like quantum chemistry!