What are the major issues of our science?

- **Nuclear matter under extreme conditions.**
  - High density (Westfall, Li)
  - Low density (de Souza, Yennello, Viola, Natowitz, Van Goethem, Elliott, Trautmann, Das Gupta, Mader)
  - Extreme Isospin (Li, Yennello, Van Goethem, Trautmann)

- **Nuclei and their decay modes under extreme conditions:**
  - Limits of nuclear charge (Loveland)
  - Limits of nuclear deformation (Phair)
  - Limits of nuclear isospin (Charity, Sobotka)

- **Nuclear dynamics:**
  - Non-equilibrium phenomena (Verde, Viola, de Souza, Van Goethem)
  - Dynamical fragment formation (de Souza, Viola, Van Goethem, Trautmann)
  - Tests of transport theory (Verde)
  - Fission (Phair, Loveland)
  - Fusion (Loveland)
We need to find ways to make our accomplishments more broadly known!

- Silicon Readout
- Isotope beams
- Reaction studies with rare
- Plasma and neck
- Isochron dependence of EOS
- Interstellar developments

- Flow and EOS
- Fission barriers
- and Isotopic Yields
- Scaling of elemental
- Caloric curve
- Multitemperature
- Impressive Progress
What are the challenges?

- **Nuclear matter under extreme conditions:**
  - symmetric matter EOS: improved granularity.
  - Extreme isospin:
    - Additional theoretical work on signatures for isospin dependence of the EOS.
    - Additional experimental work, e.g. neutron/proton flow comparisons, etc.
  - Liquid-gas phase transition:
    - How or why does the equilibrium picture work?
    - Do we have the right experimental tools?
      - ISIS, EOS, decommissioned. HiRA, Nimrod are new, but have limitations.
    - New $4\pi$ device (longer term).
• **Nuclei and their decay modes:**
  
  – Level densities, fusion measurements:  
    Clean accurate beam tagging tracking system (fast ΔE counter).
  – Fission measurements: TPC for rare isotope beam measurements. (longer term)

• **Nuclear dynamics:**

  – Better simulation tools:
    • Neck fragmentation, “strongly-damped” and negative heat capacity results derived from similar data sets.

  – Further theoretical work on dynamical cluster and fragment emission.
    • Preequilibrium fragment emission in light ion reactions.
    • Neck fragmentation.