



# TeraScale Supernova Initiative

<http://www.phy.ornl.gov/tsi/>



Nationwide, interdisciplinary collaboration.  
More than 100 people! More than 25 institutions!

Explosions of massive stars



Relevance:

- ⇒ Element Production
- ⇒ Cosmic Laboratories
- ⇒ Driving Application

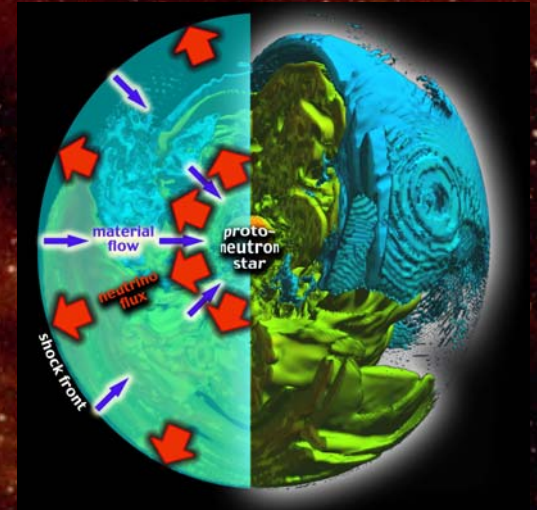
⇒ Ascertain the “core collapse supernova” mechanism(s).

⇒ Understand core collapse supernova phenomenology:

- element synthesis, neutrino and gravitational wave signatures, ...

Modeling Requirements:

- ⇒ Radiatively (Neutrino) and/or MHD Driven
- ⇒ Fluid Instabilities
- ⇒ Rotation
- ⇒ Magnetic Fields
- ⇒ Nuclear Burning
- ⇒ Tera-, Peta-Scale Linear System Solution
- ⇒ Terabytes of Data
- ⇒ 3D Visualization



\* No realistic 2D or 3D models exist!

\* 100 Tflops sustained would enable 3D high-resolution, realistic models.