

# Nuclear Astrophysics Content Expectations for Illinois

## National Science Educational Standard: Physics

### **12. Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences**

- 12.C.4b Analyze and explain the atomic and nuclear structure of matter.
- 12.C.5a Analyze reactions (e.g., nuclear reactions, burning of fuel, decomposition of waste) in natural and man-made energy systems.
- 12.D.4b Describe the effects of electromagnetic and nuclear forces including atomic and molecular bonding, capacitance and nuclear reactions

## National Science Educational Standard: Earth and Space Science

### **12. Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.**

- 12.F.4a Explain theories, past and present, for changes observed in the universe.
- 12.F.4b Describe and compare the chemical and physical characteristics of galaxies and objects within galaxies (e.g., pulsars, nebulae, black holes, dark matter, stars).
- 12.F.5a Compare the processes involved in the life cycle of stars (e.g., gravitational collapse, thermonuclear fusion, nova) and evaluate the supporting evidence.

## National Science Educational Standard: Science and Technology

### **13. Understand the relationships among science, technology and society in historical and contemporary contexts.**

- 13.A.4c Describe how scientific knowledge, explanations and technological designs may change with new information over time (e.g., the understanding of DNA, the design of computers).

## National Science Educational Standard: Science in Personal and Social Perspectives

### **13. Understand the relationships among science, technology and society in historical and contemporary contexts.**

- 13.B.5a Analyze challenges created by international competition for increases in scientific knowledge and technological capabilities (e.g., patent issues, industrial espionage, technology obsolescence).

13.B.5e Assess how scientific and technological progress has affected other fields of study, careers and job markets and aspects of everyday life.