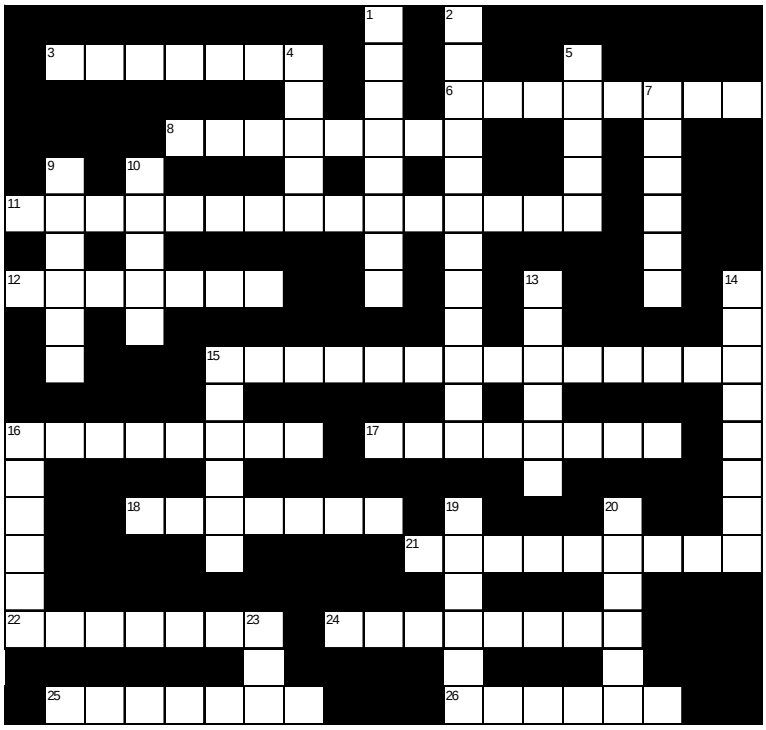
Nuclear Astrophysics Crossword Puzzle



ACROSS:

3. Cosmic rays are these kinds of particles that can be detected on the ground or in air.

6. These kinds of elements have the same number of protons but differ in their number of neutrons.

8. A nuclear _____ occurs when one nucleus changes into a different nucleus.

11. The process in which heavier elements are synthesized from hydrogen in the interior of stars.

12. The splitting of an unstable atomic nucleus into two or more nuclei

15. A kind of nuclear reaction where a neutron collides with an atomic nucleus to combine and form a heavier nucleus (2 words)

16. This is the dominant energy source of energy in stars heavier than the sun by converting hydrogen into helium (2 words).

17. Scientists are able to decode each star's stellar _____ by determining the wavelength that each star is radiating.

18. This is determined by finding the number of protons in the nucleus

21. This is energy in the form of waves that is emitted after nuclear reactions

22. This is the central-most region of an atom, and contains most of the atom's mass.

24. Wolfgang Pauli was the first to theorize that this massless particle must exist in order to conserve energy during beta decay reactions.

25. These are the result when a positron and an electron annihilate

26. Fusing elements greater than iron uses more of this than it produces.

DOWN:

1. The sun _____ by emitting energy

2. These stars are stable and in the middle phase of their development

4. To disintegrate or diminish by radioactivity

5. These 'cauldrons of the cosmos' produce many of the elements found on Earth.

7. A deuteron is comprised of this and a neutron.

9. Light nuclei combine with other nuclei to form a heavier element during this process.

10. A helium _____ is the sudden beginning of helium fusion in the cores of intermediate mass stars.

13. After hydrogen runs out, these types of stars are brighter with a larger diameter and lower density.

14. An elementary particle with a negative charge

15. Physics of the atomic _____ studies the masses, shapes, and structure of isotopes.

16. This element has six protons and is the 4th most abundance element in the universe.

19. The star's anatomy has an interior core, a "liquid" _____, and an outer crust.

This is one of the four fundamental forces that bind quarks together to make protons and neutrons.

23. This star is at the center of our planetary system.