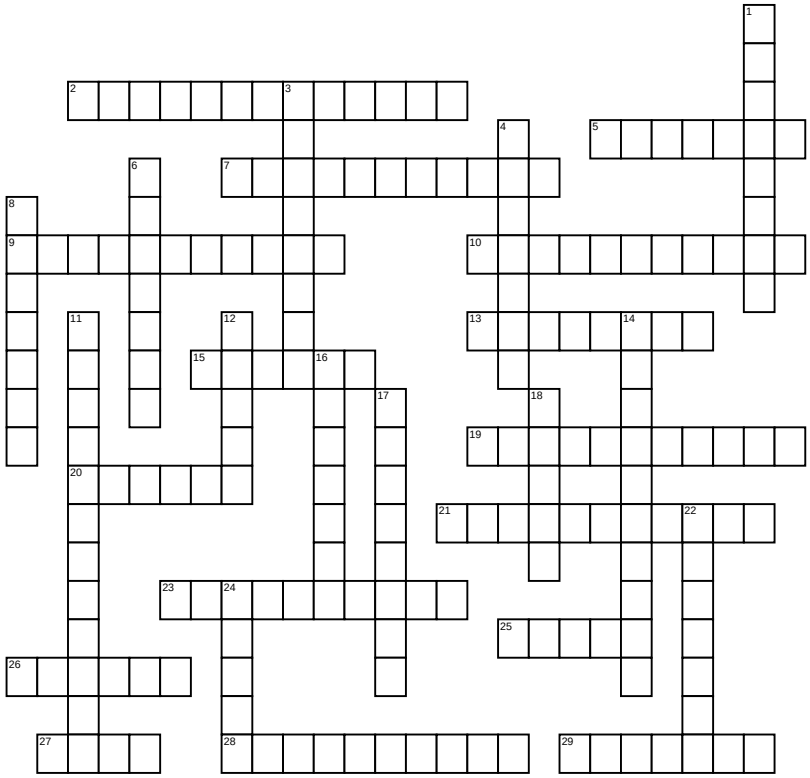

ACROSS

2 The _____ effect is a quantum electronic phenomenon in which electrons are emitted from matter after the absorption of energy from electromagnetic radiation.

5 Einstein's _____ theory of relativity not only widened the postulate of relativity but added the second postulate - that all observers will always measure the speed of light to be the same no matter what their state of uniform linear motion is.

7 Length _____, according to the special theory of relativity, is the physical phenomenon of a decrease in length detected by an observer in objects that travel at any non-zero velocity relative to that observer.

9 The Heisenberg _____ principle gives a lower bound on the product of the standard deviations of position and momentum for a system, implying that it is impossible for a particle to have an arbitrarily well-defined position and momentum simultaneously.

10 Electron _____ is a technique used to study matter by firing electrons at a sample and observing the resulting interference pattern.

13 The _____ is the antiparticle of the electron.

15 The _____ constant is a physical constant that is used to describe the sizes of quanta, which plays a central role in the theory of quantum mechanics.

19 Mass-energy _____ is the concept that any mass has an associated energy and vice versa.

20 _____'s law describes the spectral radiance of electromagnetic radiation at all wavelengths from a black body at a certain temperature.

21 Of central importance in non-relativistic quantum mechanics, the _____ equation describes the space and time dependence of quantum mechanical systems.

23 A _____ particle or fundamental particle is a particle not known to have substructure; that is, it is not known to be made up of smaller particles.

25 The speed of _____ in vacuum is the speed in a vacuum of anything having zero rest mass.

26 A _____ is a volume of space that is essentially empty of matter, such that its gaseous pressure is much less than standard atmospheric pressure.

27 The _____ interaction is one of the four fundamental interactions of nature. It is due to the exchange of the heavy W and Z bosons. Its most familiar effect is beta decay.

28 The _____ of simultaneity is the concept that simultaneity is not absolute, but dependent on the observer.

29 The de _____ hypothesis is the statement that all matter (any object) has a wave-like nature, in other words, wave-particle duality.

DOWN

1 Time _____ is the phenomenon whereby an observer finds that another's clock which is physically identical to their own is ticking at a slower rate as measured by their own clock.

3 Albert _____ (1879 - 1955) was a German-born theoretical physicist. He is best known for his theory of relativity and, specifically, mass-energy equivalence.

4 The event _____ is a general term for a boundary in spacetime, such as an area surrounding the black hole, beyond which events cannot affect an outside observer.

6 The _____ transformation converts between two different observers' measurements of space and time in a manner consistent with special relativity, where one observer is in constant motion with respect to the other.

8 _____ theory is the branch of physics which is based on quantization, which began in 1900 when Max Planck published his theory explaining the emission spectrum of black bodies.

11 Corresponding to most kinds of particles is an associated _____ with the same mass and opposite charges.

12 A _____ hole is a region of space in which the gravitational field is so powerful that nothing can escape after having fallen past the event horizon.

14 A principle of _____ is a criterion for judging physical theories, stating that they are inadequate if they do not prescribe the exact same laws of physics in certain similar situations.

16 _____ scattering is the decrease in energy of an X-ray or gamma ray photon, when it interacts with matter.

17 The _____ Model of particle physics is a quantum field theory developed between 1970 and 1973 which describes three of the four known fundamental interactions between the elementary particles that make up all matter.

18 The _____ is one of the two basic constituents of matter in particle physics (the other is the lepton).

22 _____ relativity is the geometrical theory of gravitation published by Albert Einstein in 1915-16.

24 In the late 19th century, luminiferous _____ was the term used to describe a medium for the propagation of light. Today this theory is regarded as a superseded scientific theory.