## Kaluza-Klein Theory

Prior to 1921, Theodor Kaluza applied Einstein's new general relativity to five dimensions and produced a unified theory of electromagnetism and gravitation wherein the ordinary 4-dimensional gravitational field and the electromagnetic field are but two different aspects of a single more fundamental field: the 5-dimensional gravitational field. Kaluza's theory was published in 1921, on the personal recommendation of Albert Einstein, who had had Kaluza's paper for two years. In Kaluza's model, electromagnetics is the 5th dimensional aspect of the 5-d G-field, while the ordinary 4-d G-field is the intersection of the 5-d G-field with our ordinary world.

Kaluza theory contains many potentials that are as yet unknown and undiscovered in nature. When undue simplifications are made to arbitrarily exclude the unknown potentials, the adapted theory leads to errors in its predictions. This was originally regarded as a great imperfection, and Kaluza theory fell into disfavor for decades. Then, as modern particle physicists began to produce fundamental particles of an astounding variety, a Kaluza-Klein theory of 11 or more dimensions was found to very reasonably describe the emerging situation. Once again, Kaluza-Klein theory is a moving force among modern theorists.

Five years after Kaluza's epochal unification of gravitation and electromagnetics by adding an extra 5th dimension to relativity, Klein explained why the extra dimension is not seen. He modeled it as "wrapped around" each point in ordinary 3-space. Thus in the Kaluza-Klein approach, an EM wave does not flow through or in 3-space at all. Instead, it flows in the fifth dimension, flowing or "sliding around" each point in 3-space. This can only be perceived by the 3-space observer as if it "moved through 3-space." (Bearden, Thomas E.; Analysis of Scalar/Electromagnetic Technology; Tesla Book Company; P. O. Box 121873, Chula Vista, CA 91912)