216(10): Transition from Precessing Conical Section to Hyperbolic Spiral.

The transition law, discovered by Horst Eckardt, is:

$$\theta = 1 + \epsilon \cos(x\theta) \quad -(1)$$

This transforms the precessing conical section:

$$r = \frac{\alpha}{1 + \epsilon \cos(x\theta)} \quad -(2)$$

to the hyperbolic spiral:

$$r = \frac{\alpha}{\theta} \quad -(3)$$

Summary of the New Cosmology

Based on the well known observation in astronomy of precessing elliptical orbits in the solar system, eq. (2) was inferred. This is the equation of the conical sections with precession constant x. The gravitational Lagrangian dynamics produced the precessing elliptical orbit: potential that gives the precessing elliptical orbit:

$$V = -\frac{kx^2}{r} + \frac{(x^2-1)k\alpha}{2r^2} \quad -(4)$$

where k is a constant. This has the same format as the well known H atom potential of the Schroedinger equation:

$$V = -\frac{e^2}{4\pi\epsilon_0 r} + \frac{l(l+1)\hbar^2}{2mr^2} \quad -(5)$$

It was found that the precessing elliptical orbit is given by:

$$\epsilon < 1 \; ; \; x \sim 1 \qquad -(6)$$

If x is allowed to vary a vast number of new orbits emerge, initiating a new subject of the cosmology based on the precessing conical sections (2).

Gravitational deflection of a mass m by a mass M is described by the same force law:

$$F = -\frac{\partial V}{\partial r} \qquad -(7)$$

$$= -\frac{kx^2}{r^2} + (x^2 - 1)\frac{k\alpha}{r^3}.$$

All precessing orbits of any type can be described by eq. (2). It is likely that all gravitational phenomena can be described by eq. (2).

This analysis is for planar orbits and can be extended to ~~three~~ dimensional orbits. The vast number of new orbits predicted by eq. (2) can be researched using the contemporary methods of astronomy.