219(1): Application of UFT 218 to Helical Type Structures.

The new equation for the three dimensional orbit is:

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

where:

$$x = \frac{r}{R} \quad -(2)$$

When

$$\epsilon = 0 \quad -(3)$$

$$\alpha^2 = r^2 + Z^2. \quad -(4)$$

Consider the case:

$$Z = Z_0\theta \quad -(5)$$

the eq. (4) becomes the helix. Parity inversion produces the mirror image helix. The double helix occurs in nature from molecular structures (DNA) to nebulae.

Using eq. (5) in eq. (1):

$$R^2 = r^2 + Z_0^2\theta^2 \quad -(6)$$

so

$$x = \frac{r}{(r^2+Z_0^2\theta^2)^{1/2}}. \quad -(7)$$

In this case eq. (1) is:

$$(r^2 + Z_0^2\theta^2)^{1/2} = \frac{\alpha}{1+\epsilon\cos(x\theta)}$$

$$-(8)$$

) where x is given by eq. (7).

Eq. (8) can be solved by computer to give plots of r against θ in three dimensions. In the case (3) the plot is a helix. If ϵ is increased slightly the helix becomes distorted, and evolves into three dimensional fractal patterns.

The force law is <u>always</u>:

$$F(R) = -x^2 \frac{mMG}{R^2} + (x^2 - 1)\frac{L^2}{mR^3} \quad - (9)$$

where $\underline{R}$ is the vector between m and M.

The potential of gravitation is:

$$U(R) = -\frac{mMGx^2}{R} + \frac{(x^2-1)L^2}{2mR^2} \quad - (10)$$

<u>CONCLUSION</u>

These simple equations produce all the helical like orbits which may be observed in three dimensions, and a vast array of new fractals