$$x'(t) = f(x, y, z, u, t)$$
$$y'(t) = g(x, y, z, u, t)$$
$$\vdots$$
$$u'(t) = \dots$$

For RK-4:

$x'(t) = z \quad x(0) = 1 \quad x(t) = z \cdot t + 1$

$y'(t) = u \quad y(0) = 0 \quad y(t) = u \cdot t$

$z'(t) = -x\left(x^2+y^2\right)^{-3/2} \quad z(0) = 0 \quad z(t) = -x \cdot t\left(x^2+y^2\right)^{-3/2}$

$u'(t) = -y\left(x^2+y^2\right)^{-3/2} \quad u(0) = 1 \quad u(t) = -y \cdot t \cdot \left(x^2+y^2\right)^{-3/2} + 1$

Plug into MATLAB for the results on next few pages.