

1014-M1-67

Andrew J. Simoson* (ajsimoso@king.edu), 1350 King College Road, Mathematics Dept, King College, Bristol, TN 37620. *Playing Ball in a Rotating Space Station*.

This talk will contrast the tossed ball trajectories in ordinary gravity as induced by mass attraction and in artificial gravity as induced by rotation. We use as illustrations the spaceship *Discovery* of the 1968 film *2001* and the *Little Prince's* asteroid *B-612*. We demonstrate that a pitcher can throw quite a change-up curve ball aboard *Discovery*, an impossible pitch on Earth or on the asteroid. Although the motion formulas can be derived using the round-about tools of classical mechanics, we outline the motion derivation via rotation matrices, and in so doing generate a colorful fractal based upon proximity to the one singular velocity of the ball—that is, the velocity $-\omega r$, where ω is the rotation rate of the space ship and r is distance of the ball from the axis of rotation. (Received July 13, 2005)