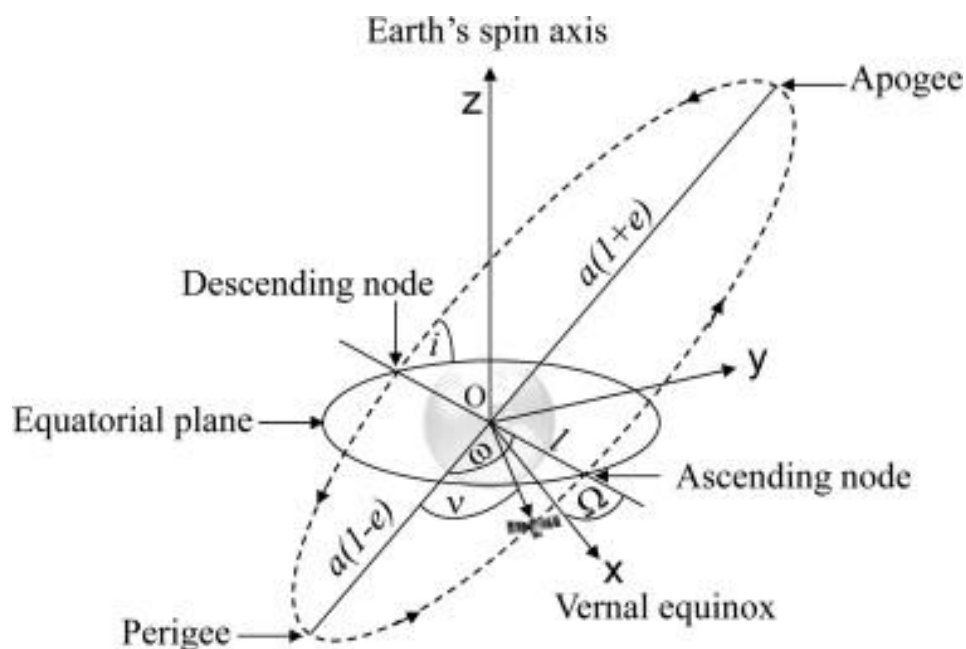


Path geometry and the Kepler problem

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Abstract:

The Kepler problem is the differential equation modeling one planet moving around a sun. Upon fixing the energy and plane of motion, the orbits are conic sections with fixed focus and fixed major axis. These curves form a two parameter family of unparametrized curves in the plane, or a path geometry. In this talk we will show the symmetry group of these fixed energy Kepler path geometries is $SL_2(\mathbb{R})$. Also, we will see that among central force problems these Lie point symmetry groups of the Kepler problem are exceptional.