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Toward Bertrand's theorem for surfaces of revolution

In classical mechanics, Bertrand's theorem states that the only two types of central potentials for which all the bounded orbits are closed are the gravitational potential and the harmonic oscillator potential. In this talk I will consider the motion of a particle on a surface, under the influence of a central force field, and I will discuss Bertrand's theorem in the case of surfaces of revolution. I will present some results and some open questions.