Title: Charged stars in third order Lovelock gravity

Abstract

In this talk, we study the gravitational dynamics of charged stellar objects in third order Lovelock gravity. We generate the field equations for such a charged fluid distribution in arbitrary spacetime dimensions. The spacetime geometry is static and spherically symmetric. The third order Lovelock field equations are derived in full generality in the presence of an electromagnetic field. The charged condition of pressure isotropy is a first order nonlinear differential equation (not of standard form) that can be regarded as an extension of the Abel differential equation of the second kind. We are able to show that such an equation can be solved by constraining the coefficients of certain terms. Explicit solutions for the metric potentials are presented for the particular dimension $N=7$. Our seven dimensional charged solution reduces to the neutral third order Lovelock solution when the electromagnetic field is absent. Finally, we analyse the physical viability of our seven dimensional charged solution and test the effects of charge on the stellar structure.