Self-gravitating collections of "particle-like" objects are found on the scale of galaxies as well as the entire universe. In this talk I will present the Vlasov model for describing such systems where the gravitational interaction is modeled in different scenarios using Newtonian gravity or with general relativity. Axisymmetric equilibrium solutions to the corresponding equations are numerically constructed using a finite-element code. We will explore the rich space of numerical solutions including ones with flattened and toroidal shapes as well as solutions with black-hole like behavior. This talk will be accessible to those familiar with calculus.

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For a complete abstract, go to http://www.humboldt.edu/math/news-and-events/math-colloquium