



## PHYSICS SEMINAR



Friday, April 26, 2002  
2:00PM, SETB 1.350

# TRACKING THE THERMAL HISTORY OF COLD DARK MATTER (CDM)

Prof. Roberto Sussman  
Universidad Nacional Autónoma de México

**Abstract:** Relativistic generalizations of the isothermal sphere follow by numerical integration of Einstein's field equations for equilibrium Maxwell-Boltzmann gases. In their newtonian limit these configurations provide adequate models for dark matter halos of astrophysical structures, going from dwarf galaxies, to large spirals and clusters of galaxies. Given the mass of the CDM particle, the temperature of the halo fixes the rotation velocity, while the specific entropy fixes the central density and core radius of the halo. Tracing the entropy production associated with the thermal history of a CDM candidate, from decoupling to the present era, allows us to compare observed CDM halos to predictions for a variety of popular particle candidates. The best fit to observed data seems to favour particle masses between 10 and 100 GeV, a range of mass containing various supersymmetric particle candidates.

*Refreshments will be served.*