Instituto de Astronomía
Universidad Nacional Autónoma de México
Sede Ensenada, Baja California, México

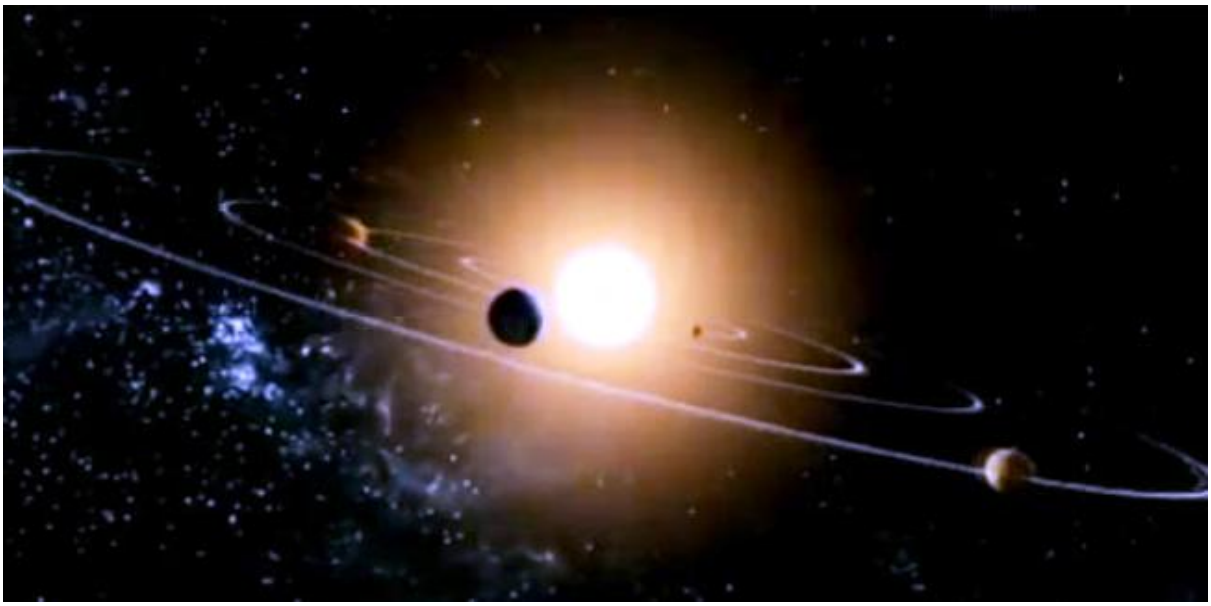
Seminario de Investigación

Miércoles, 10 de Octubre de 2012
11:00 hrs, Auditorio IA-Ensenada

Rodney Gomes

(Observatorio Nacional de Brazil)

"A PUTATIVE PLANETARY MASS SOLAR COMPANION: SIGNATURES FROM SEDNA AND LARGE SEMIMAJOR AXIS CENTAURS"



The idea of a planetary mass solar companion was proposed to explain the orbit of Sedna and the hypothetical population to which this object must belong. In this work we seek signatures of this possible companion in other populations of trans-Neptunian objects and large semimajor axis Centaurs (Laces). Through an observational simulator we estimate relative amounts of scattered objects and Lace's from numerical models and compare with the ratios coming from actual observations. The ratio between the amount of observed scattered objects and Lace's (a $>$ 300 AU) is 31. From realizations of the observational simulator on a population obtained after 4.5 Gy numerical integration of the giant planets and a disk of planetesimals under the Nice model, plus the effect of the galactic tide, we get a ratio around 200–300. Considering as high semimajor axis Centaurs those with a $>$ 500 AU, the ratio between scattered objects and Laces remains 31 while the observational simulator yields a value $>$ 400. When we include in the numerical model a planetary mass solar companion with 10^{-4} solar mass, a = 1500 AU, e = 0.4 and I = 40 deg., the above ratios become $\sim$ 20 and $\sim$ 40 for the case of Laces with a $>$ 300 AU and Laces with a $>$ 500 AU, respectively. These results seem to indicate that at least three Centaurs with larger semimajor axes OO67 2000 (a = 653 AU), 2006 SQ372 (a = 906 AU) and 2012 DR30 (a = 1104 UA) have been observed too early and that a planetary mass solar companion would be compatible with these early observations.