# Peculiar Euphrosyne

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(31) Euphrosyne is the largest body of its namesake family, and contains more the 99.35% of the family mass. Among asteroid families, the Euphosyne group is peculiar because of its quite steep size frequency distribution, significantly depleted in large and medium- sized asteroids ($8 < D < 12$ km). The current steep size frequency distribution of the Euphrosyne family has been suggested to be the result of a grazing impact in which only the farthest, smallest members failed to accrete. The Euphrosyne family is however also very peculiar because of its dynamics: near its center it is crossed by the $\nu_6 = g - g_6$ linear secular resonance, and it hosts the largest population (140 bodies) of asteroids in $\nu_6$ anti-aligned librating states (or Tina-like asteroids) in the main belt.

In this work we investigated the orbital evolution of newly obtained members of the dynamical family, with an emphasis on its interaction with the $\nu_6$ resonance. Because of its unique resonant configuration, large and medium sized asteroids tend to migrate away from the family orbital region faster than small-sized objects, that were ejected further away from the family center. As a consequence, the size-frequency distribution of the Euphrosyne family becomes steeper in time, with a growing depletion in the number of the largest family members. We estimate that the current size-frequency distribution could be attained from a typical, initial size-frequency distribution in time-scales of the order of 1 Byr, consistently with estimates of the family age obtained with other, independent, methods.

**References:** Carruba V., Aljbaae, S., Souami, D, 2014, APJ, in preparation.