

Asteroids mixing throughout the Solar System

A detailed survey of asteroids has shown that the distribution of different types of asteroid groupings throughout the solar system is much more complex than previously thought, implying a very dynamic early solar system.

- Asteroids are grouped into types based on their emission spectra or color. The first comprehensive look of 1,000 asteroids in the 1980s showed clear groupings with distance, with those in the inner part of the main asteroid belt more reflective and 'redder' than those in the outer part which were 'bluer,' suggesting that asteroids in the solar system formed roughly in place. However, the past decade has seen an increase in "rogue" asteroids that don't fit the original trends.
- Data from the Sloan Digital Sky Survey, color measurements of 100,000 asteroids, have allowed scientists to create a compositional map of asteroids as small as 5 km in diameter. The new map shows that the trends of smaller asteroids are different than larger asteroids and indicates that there has been more mixing of compositional types as a function of distance and size than previously known.
- This finding is consistent with the models that predict a dynamic early solar system with planetary migration significantly affecting the smaller bodies. However, this mixing could also be due to subsequent unknown processes.

