Space Travel via Chaotic Transport

Martin.Lo@jpl.nasa.gov, 818-395-7169
Navigation and Mission Design Section
Jet Propulsion Laboratory, California Institute of Technology

Abstract: Our Solar System is interconnected by a vast system of invariant manifolds of unstable orbits. These manifolds provide very low-energy trajectories for transport throughout the Solar System. Comets and asteroids like ShoemakerLevy9 have traveled these ancient pathways for eons. They also provide efficient trajectories for spacecreaft. The Genesis mission is currently flying in such an orbit to collect and return solar wind samples to Utah, USA in 2004. The Jupiter Icy Moons Orbiter, Terrestrial Planet Finder, Darwin, and the Lunar L_1 Gateway missions are all considering using these orbits.