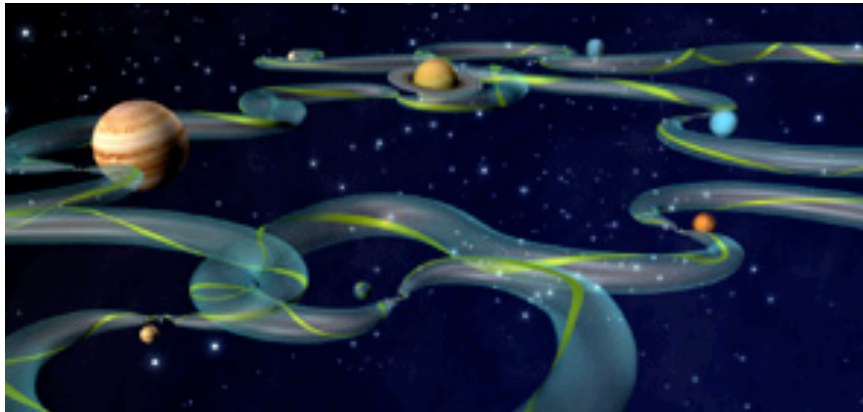


# **Solar System Navigation (ASTE599)**

## **Fall Semester 2014**

**Recommended Preparation: ASTE580 or equivalent course in Orbital Mechanics**

**3 Lecturers (in order of presentation): Dr. Hintz, Dr. Goodson, Dr. Anderson**  
**POC: Gerald R. Hintz (ghintz@usc.edu)**



**The Interplanetary Superhighway**

## **Topics**

### **Segment 1:**

- **Free-Return Lunar Trajectory Analyses (“Houston, we have a problem.”)**
- **Circular Restricted 3-Body Problem**
- **Lagrange Points**
- **Mission Applications of the Past, Present and Future**

### **Segment 2 – Optimization and Control of Interplanetary Trajectories:**

- **Targeting Encounter/Flyby Conditions**
- **Optimization Concepts**
- **Trajectory Optimization Methods**

### **Segment 3 - Mission Design Using the Interplanetary Superhighway:**

- **Dynamical Systems Theory for Mission Design: Introduction and Survey**
- **Additional Three-Body Models and the Ephemeris Model**
- **Libration Orbit Design and Continuation**
- **Stability and Invariant Manifolds**
- **Interplanetary Superhighway and Beyond**