# Simulating the inner planets of the Solar System using numeric integration

## Introduction

In this project I have created a simulation of the inner plants of the solar system. The aim was to create a realistic simulation in order to perform experiments and see if the results match the real world. The experiments I implemented were “Satellite to Mars” and “Asteroids and doomsday”. With launching a satellite to mars I wanted to confirm simulated results from the calculated orbit, and with the asteroid simulation I wanted to create a simulation where I could randomly generate asteroids anywhere within the simulation and calculate if any of these asteroids would come within a close distance of Earth in order to see if impact events are likely.

## Methods

# A description of your program design and the algorithms you have implemented

### Planet Class

This class is designed to represent a planet. It has no methods except a constructor. The class stores values for name, mass, position, velocity, radius and colour. Name is used to identify a planet, so that each instance can be found within the simulation.

### Solar Class

This is the actual simulation class. This class is initialised with a csv filename which contains the data for the planet objects which is read in through the method ‘loadPlanets that reads all the parameters from the file to create a Planet object, which is the appended to a list called self.planets. The class also contains a class getPlanet that returns a planet with the name passed in.