### Tags: Model

*This project aims to achieve a better asteroid orbit prediction, especially the Apophis one as it was proposed in the Challenge. It includes not only an orbit prediction and simulation software of the asteroid, but also which equipment the CubeSat is provided, its design and how the technological system (CubeSat and other elements) would be send and get stuck to the asteroid surface to study its trajectory and other variables.*

This project is solving the [**Asteroid Hunter**](https://2013.spaceappschallenge.org/challenge/asteroid-hunter) challenge.

**Description**

This project aims to achieve a better asteroid orbit prediction. To make it complete, it has been included not only the prediction part, but also how the technological system would be send to the asteroid. It has been considered to send a CubeSat to the asteroid surface which would study accurately the trajectory and other variables sending data to a GPS system at the earth orbit. The project specifically studies the Apophis case, as it was proposed, but it has been developed to solve the same challenge for any near-earth asteroid. Due to the distinction of the project parts, it has been divided in a couple of complementary sections to accomplish the whole objective.

The first one is based on developing software to predict the orbit of any object around another one and didactically achieve a better knowledge of the theoretical trajectory with a simulation program. As the project includes the whole mission, GPS position software has also been developed to know the exact position of the asteroid and compare it with the theoretical data.

The other part of the project tries to attain another objective of the project which is study the most efficient way of getting to the asteroid surface, in terms of orbit transferors and get stuck to the asteroid. Also it is explained which equipment the CubeSat is provided and the design that fits better due to the certain situations the CubeSat must get involved.

The project has been done to leave the door opened to future plans which would use the infrastructure of this project, such as studying the outer space radiation, Sun radiation of any spectrum and other variables to study.

**Project Information**

* License: [Creative Commons BY 3.0](http://creativecommons.org/licenses/by/3.0/)
* Source Code/Project URL: <https://sites.google.com/site/asteroidexploration/>

**Resources**

* Code Used - <https://drive.google.com/folderview?id=0B1au-c0h8KGUWmFhUWJpY0E5T3c&usp=sharing>
* NASA Orbit Elements of NEA - <http://neo.jpl.nasa.gov/cgi-bin/neo_elem>
* NASA Trajectory Search of NEA - <http://trajbrowser.arc.nasa.gov/traj_browser.php>
* NASA Orbit Diagrams of NEA - <http://neo.jpl.nasa.gov/orbits/>
* CubeSat Official Webpage - <http://cubesat.org/>
* CubeSat and Nanosatellite Solutions - <http://gomspace.com/>