# Home of Near-Earth Comets

<https://www.kaggle.com/nasa/near-earth-comets>

NASA tracks about 15,000 [near-Earth objects](https://en.wikipedia.org/wiki/Near-Earth_object) -- small Solar System bodies whose orbits bring them less than 1.3 AU from the Sun (i.e., within 130% of the the average distance between the Earth and the Sun). Of these 15,000, 160 are [comets](https://en.wikipedia.org/wiki/Comet). This dataset provides orbital data for these comets.

## The Data

### Notes on Time and Space

Timing information for each of these comets is given in [Barycentric Dynamical Time](https://en.wikipedia.org/wiki/Barycentric_Dynamical_Time), or TDB. This is, very roughly, the number of days since January 1st, 4713 BC (see [the Wikipedia article on Julian Day](https://en.wikipedia.org/wiki/Julian_day) for more info). Check out those Wikipedia articles for details.

For information on inclination, argument, and longitude of the ascending node, look at [this article](https://en.wikipedia.org/wiki/Orbital_inclination).

The *non-gravitational forces* are [effects that accelerate or decelerate the comet](http://www.oxfordreference.com/view/10.1093/oi/authority.20110803100237517), such as jets of gas.

This dataset contains the following fields:

**OBJECT**: the name of the comet

1. **Epoch**: the [epoch](https://en.wikipedia.org/wiki/Epoch_(astronomy)) for the comet, in TDB
2. **TP**: time of perihelion passage, in TDB; this is the time when the comet was closest to the Sun
3. **e**: the [orbital eccentricity](https://en.wikipedia.org/wiki/Orbital_eccentricity) of the comet
4. **i**: INCLINATION OF THE ORBIT with respect to the ecliptic plane and the equinox of J2000 (J2000-Ecliptic), in degrees
5. **w**: ARGUMENT OF PERIHELION (J2000-Ecliptic), in degrees
6. **Node**: LONGITUDE OF THE ASCENDING NODE (J2000-Ecliptic), in degrees
7. **q**: COMET'S DISTANCE AT PERIHELION, in AU
8. **Q**: COMET'S DISTANCE AT APHELION, in AU
9. **P**: ORBITAL PERIOD, in Julian years
10. **A1**: NON-GRAVITATIONAL FORCE PARAMETER A1
11. **A2**: NON-GRAVITATIONAL FORCE PARAMETER A2
12. **A3**: NON-GRAVITATIONAL FORCE PARAMETER A3
13. **MOID (AU)**: MINIMUM ORBIT INTERSECTION DISTANCE (the minimum distance between the osculating orbits of the NEO and the Earth)
14. **ref**: Orbital solution reference

## What Should We Try?

What can we do with this dataset?

1. plot the comets' orbits
2. combine with Earth's orbital data to predict close approaches