

A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

Python Decal Final Project

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Background

- Given a planet's distance r away from a host star of mass m , we can trace out any orbital trajectory
- As a star ages, it loses a percentage of its mass through fusion and solar wind
- We can plot the mass of the star as a decreasing function of time
- When the mass of a star decreases, the gravitational force between the planet and the star decreases
- The average distance between the star and the planets increases, resulting in the planet's orbit spiraling outwards



Methods and Techniques

1. Brainstorming how we can approach and scope of the project
2. Understanding orbital mechanics between a star and planet
3. Identifying equations for mass loss of a star
4. Writing up a program that tests our predictions
5. Analyzing our results

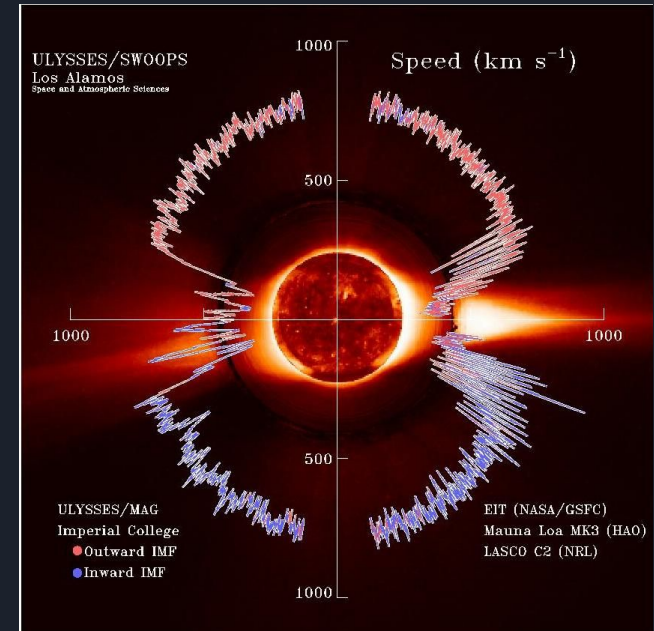


Project Stages

1. Simulating changes in orbital project based on a constant rate of sun's mass loss
2. Simulating based on the nuclear fusion, with additional factors such as solar wind and CME

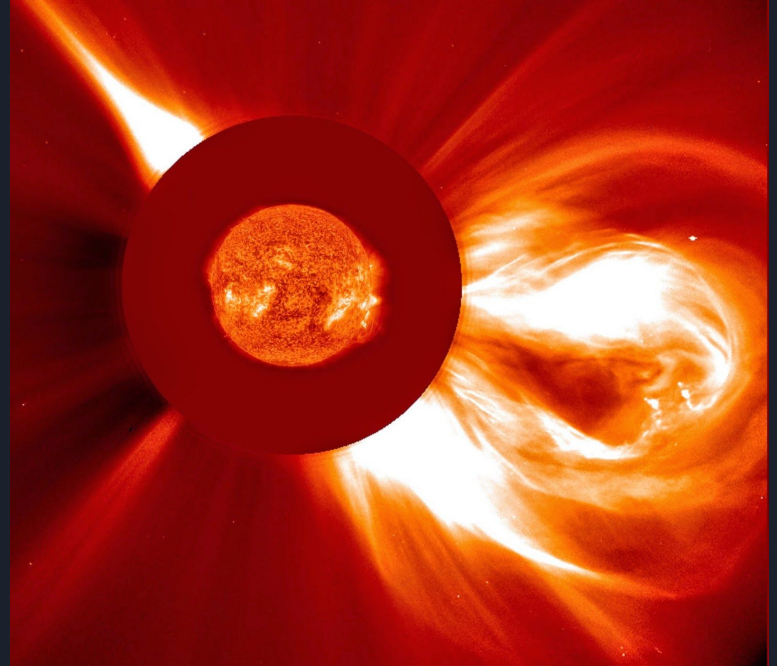
Solar wind

- generating a “wind” of ionized particles
- varying a bit in intensity
- Sun loses about 1.5 million tonnes of material each second due to solar wind

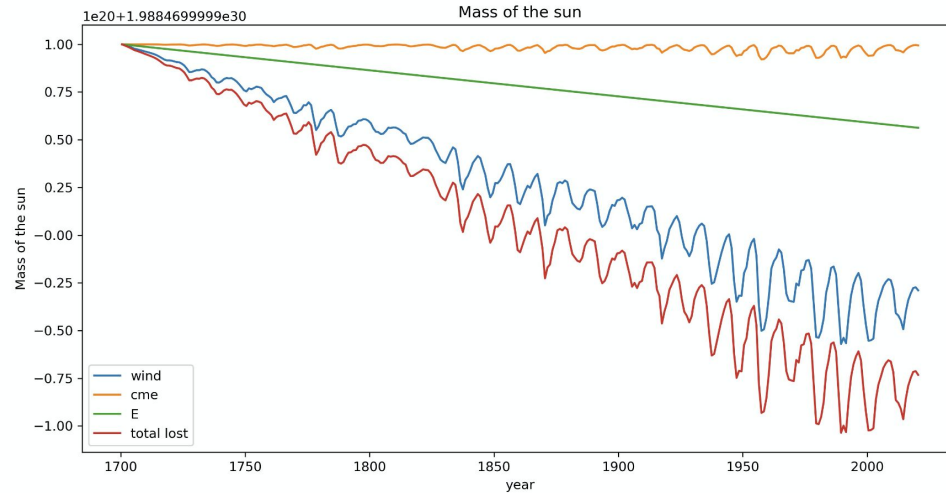


CME: Coronal mass ejections

- magnetically driven eruptions of plasma and electromagnetic energy
- eject billions of tons of coronal material and carry an embedded magnetic field
- also referred to as "solar storms" or "space storms"



Findings and Results





Demo



References and Citations

[Iorio 2010](#)

[Pitjeva 2011](#)