Halley

New Mexico Supercomputing Challenge

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Team #: 062

Shiprock High School

Team Member:
1. Valerie Pettigrew

Sponsoring Teachers:
1. Mrs. Noble
2. Mrs. Hines
3. Mrs. Johnson

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Executive Summary

What is a comet? A comet is a vast cloud of form of dust and gas formed outside of our atmosphere. The type of gasses combined through the black dust is hydrogen, oxygen, and nitrogen: Iron, carbon, silicon, water, methane, ammonia, and many other elements are gathered to form a solid mixture which a portion is gathered at the center of the cloud and pulled there by the effect on gravity. The larger the comet is formed in the center, the stronger it is pulled and the greater appetite to gravitational effect. Thermonuclear action reaction occurs through this process by the infant Sun. The Sun compacts a mass of gust where temperatures rise to a million degrees. A comet orbits the Sun in the atmosphere. The hydrogen atoms are stripped into a sub atomic commponents and rebuild them with a new element called helium. Once this element is formed, it cannot be cracked asunder.

The process of the mixtures formation gives great qualities of energy that would generate at the center, keeping both nuclear reactions going and counteracting the tendency for it to shrink into a much smaller size. A comet is basically a huge block of ice with dust grain embedded by the atmosphere.

Introduction

My project is about the comet Halley discovered in late 1705 by Edmond Halley and therefore named after him. Halley's Comet is very unique from other comets facts found by that tail structure, the greatest distance from the Sun, and Comet Halley was only possible to see the surrounding opaque gas cloud called coma. Following what Edmond Halley's theory on Newton's law on finding out the gravitational effect the comet has based on a follow up of time. Understanding the process of gravitational forces of the Sun attracting to the planets is used in Newton's theory. I hope to predict the next perihelion after the year 2062. The next perihelion would occur in 2138 most likely.

Hypothesis

Using Newton's theory of gravitation to determine the orbit of Halley's Comet from the recorded position in the sky as a function of time

Model

THE ORBIT OF HALLEY'S COMET
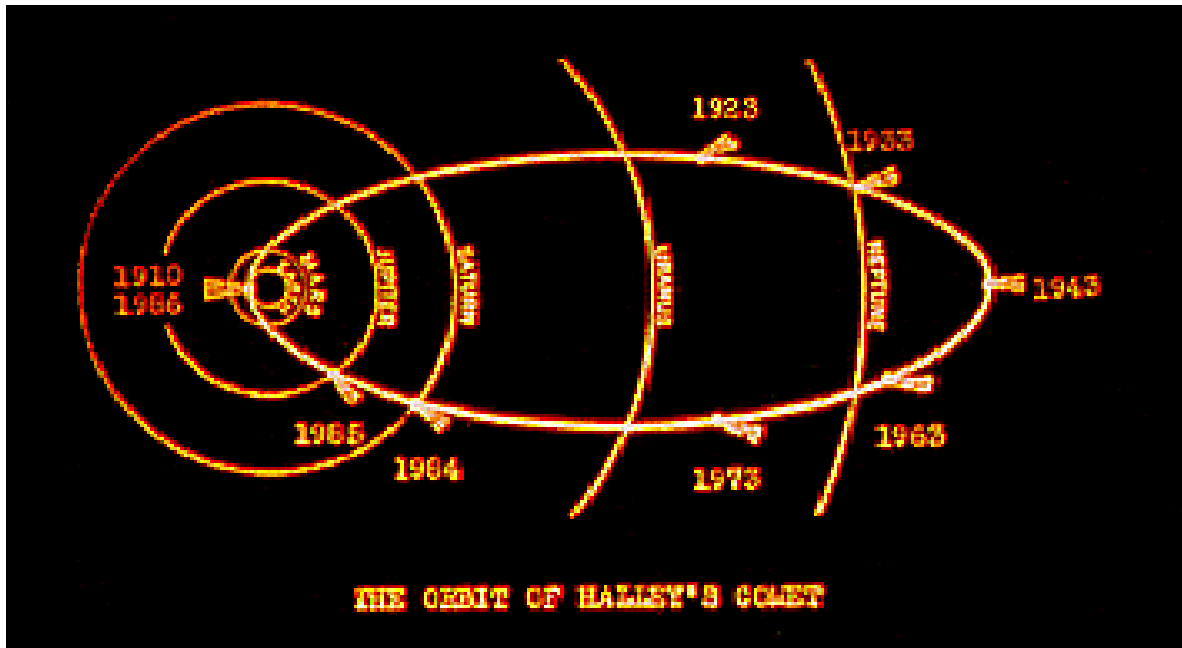
Project Description

Method

Using Newton's theory on gravitational effect on comet Halley's orbit system, I would try to find out if I can work with this procedure to see the next perihelion. The next perihelion I would include is to determine if the comet would reach earth and if it would crash or explode in the atmosphere. I would also like to explore whether the comet would crash in 2062 and would it be a devastating effect on earth.

Implementation

The program used for my project is Java. Using java would help me figure out the results on my project and would help me present my conclusions. Starting with Newton's Laws on gravitation I would be figuring out the force of two objects attracting each other. In my case I would use that planets attracting to the Sun. The greater the force would attract to the Sun the more effect it will have on that object. The farther away the object appears from the Sun the more likely it would have less energy. Halley comet appears to move close to the Sun during the time be was formed based on the observations during 1986. The more massive the object was, the more gravitational force it felt, but the more massive it was the more it became a resistant to the force of gravity. Newton's second law of force would define the measurement of force as the mass of an object times its acceleration. Using Newton's second law would determine that Halley's Comet mass would show its speed it would have and the direction that comet's orbit would head. It would also help conclude the amount of force that is applied to the Comet.

Acknowledgements

I would like to thank those who took time and their effort in helping me with my project. I couldn't have done it with out your help. My thanks go to the Supercomputing Staff, also my sponsors, Mrs. Hines, Mrs. Noble, and Mrs. Johnson, for making this project more understandable to me and leading me through it. I would like to thank James Taylor for using his time in working with us to build a code for our project. Eric Ovaska who introduced Java and for helping us build a code using a more complex module. I would also like to thank Dr. Anderson who helped me with my project in finding a math model. Levi Valdez who is one of the ones I'd like to thank for taking his time in helping me with my project and for being a great help with others as well. I appreciate you all for helping me with my project and keeping me more focused on my coding and finding a solution.

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Text Copyright Ian Ridpath.

Appendix A – Code

```
import UserInput;

public class halleyscomet
{
         public static void main (String args[])
        {
         System.out.println("Halley's Comet");
         System.exit(0);
        }
}
Still in process…
```

Appendix B – Sample A Coding

The coding I'll use for this experiment is Newton's Laws. Where the force of gravity is of masses of two objects are multiplied by the distance between the two objects. The distance between the two objects is divided by the constant number discovered until a century later. This coding would calculate the elliptical orbits for the planets and would determine the expression in this formula that all motions of all the planets according to one measurable force.

Newton's first law of inertia

$$F = G \; \frac{mm_1}{D}$$

Newton's second law

Newton's second law defined the measurement of force as the mass of object times its acceleration, and is expressed in the formula:

$$F = ma$$

F would be the force of gravity, m is the mass, and a is acceleration. The acceleration is the speed of the object or direction of an object of a certain mass, at rest or in uniform motion, is changed is directly proportional to the amount of force applied to it.