Celestial-Chase

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Github Link: https://github.com/2727995853/Celestial-Chase

Near-Earth Comets (NECs) and Meteorite Landings

Project Proposal: Near-Earth Comets (NECs) and Meteorite Landings

Story Pitch

Data-Driven Story Idea

In the year 2030, a brilliant astronomer named Dr. Elena Reyes made a groundbreaking discovery. She noticed a strange pattern in the trajectories of several near-earth comets. They seemed to be converging towards a single point in the night sky, which was unprecedented. Elena believed this convergence was more than a cosmic coincidence.

Elena shared her findings with her colleague, Dr. James Turner, a renowned geologist with a passion for meteorites. Together, they embarked on a daring mission to uncover the mystery behind these comets.

As they delved deeper into their research, they realized that the comets were on a collision course with Earth. Panic swept across the globe as news of the impending celestial threat spread. Governments around the world mobilized to prepare for a potential impact event.

By observing these incoming comets, Elena and James discovered an amazing fact: Not only are these comets very similar in shape and size, but the textures on their surfaces are also extremely similar, and they are even arranged one after another, very neatly. . It is possible that these comets were influenced by some outside presence. However, there is a high probability that the act of manipulating a comet to rush towards the earth is not a good intention, so humans must find a way to prevent the comet from colliding with the earth.

As the comet gets closer, Elena and James hatch a plan. They want to use an aerospace spacecraft to intercept a comet and study its structure, and then determine whether to deflect it from its orbit or destroy it directly. Surprisingly, when the spacecraft captured the comet, it was discovered that although the material of the comet was a normal comet, there were actually symbols similar to words appearing on its surface. This further confirms the conjecture that other intelligent civilizations control these comets.

After these comets were transported back to Earth, Elena and James studied them immediately. But no matter what methods they used, they could not damage the comet's surface. When people used a microscope to observe its surface structure, they found that the atoms that made up the comet were arranged very compactly, with no gaps at all. This is completely unimaginable technology for human technology. This also means that the technological level of the alien civilizations that control these comets far exceeds that of humans.

After the failure of launching nuclear bombs at comets and using fiber nets to intercept them, mankind fell into deep despair. People thought that the earth was about to be destroyed by these comets.

On the day when the comet entered the atmosphere, most people chose to stay at home and wait for death. But after the comet entered low-Earth orbit, it did not accelerate or change course as expected, but continued to fly at a constant speed. Eventually, the comets crashed in a desert. Some fall deeper and some fall shallower, very much like a three-dimensional coordinate system. Elena and James realized that this civilization might be sending humans the location of their own galaxy in the universe. Through searching past galaxy data, people discovered a galaxy 20 light years away from the earth that met the requirements of the coordinate information transmitted by the comet. So with hope, Elena and James used gravitational waves to send the first message to other civilizations.

Why it's Interesting and Compelling

The reason why I think this story is interesting is first of all that it is a science fiction story, which contains many concepts about alien civilizations and new technologies. This is very attractive. Additionally, this raises the question of whether comets in low-Earth orbit could fall to Earth and pose a threat to humans. I think this story makes readers think about this question.

Using Data to Answer the Question

We will use two datasets:

1. NEC Orbital Elements:
    - Data Source: Fusion Table by Javier de la Torre
    - Data Collection: J2000 heliocentric ecliptic orbital elements for 170 NECs (Near-Earth Comets) sorted by object number/name.
    - Observations: 160 rows, 17 columns.
    - Features: Object, Epoch(TDB), TP(TDB), e, i (deg), w (deg), Node (deg), q (AU), Q (AU), P (yr), MOID (AU), A1 (AU/d^2), A2 (AU/d^2), A3 (AU/d^2), DT (d), ref, Object_name
2. Meteorite Landings Data:
    - Data Source: Comprehensive dataset from The Meteoritical Society
    - Data Collection: Information on all of the known meteorite landings.
    - Observations: 45.7k rows, 10 columns.
    - Features: name, id, nametype, recclass, mass(g), fall, year, reclat, reclong, GeoLocation.

Background Research/Inspiration

We have found the following sources of inspiration and background research:

1. NASA's Real-time Asteroid Impact Prediction
    - Comparison: This source discusses NASA's real-time prediction of asteroid impacts, as mentioned in the background research.
    - Contrast: Our project goes further to explore the relationship between asteroid impact predictions, NECs, and meteorite landings.
2. Asteroid Threat Assessment Project
    - Comparison: This source discusses Characterization, Entry Simulations & Testing, Hazard Simulations, and Probabilistic Risk Assessment.

- Contrast: Our project will explore the relationship between NECs and meteorite landings, which is not extensively covered in this source.

3. LINEAR - On the Watch for Potentially Hazardous Asteroids
    - Comparison: This source discusses the LINEAR program and its role in discovering near-Earth objects.
    - Contrast: Our project complements the efforts of the LINEAR program by exploring the relationships between near-Earth comets, meteorite landings, and asteroid impact predictions.
4. Swarm of near-Earth comets linked to recent ice giant breakup
    - Comparison: This source discusses the origin and impact of near-Earth comets, as related to our story idea.
    - Contrast: Our project will also include meteorite landings and asteroid impact predictions, which are not addressed in this source.
5. Double Asteroid Redirection Test
    - Comparison: This source discusses the world's first demonstration of asteroid deflection technology, using a kinetic impactor spacecraft.
    - Contrast: Our project will explore the relationship between NECs and meteorite landings, which may have different origins and properties than asteroids.