2025 Quest Scholarly and Creative Activities Poster Symposium

The Forecast of the Solar System and the Cosmic Boneyard

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Abstract

This research highlights two planetarium shows: The Forecast of the Solar System and The Cosmic Boneyard. While Earth's weather is extreme and dynamic, it pales in comparison to the violent atmospheres of other planets and celestial objects. Stellar Evolution & the Cosmic Boneyard delves into the "zombies" of the cosmos—neutron stars, white dwarfs, and black holes—featuring extreme densities, exotic physics, and immersive perspectives. This presentation poster showcases visuals from both shows and key concepts in meteorology and stellar evolution.

Motivation

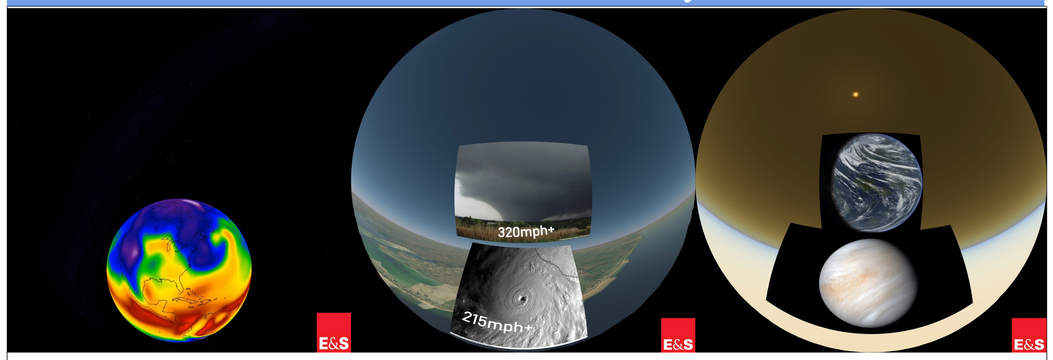
- Gaining experience with the Digistar 7 planetarium software.
- Researching astronomical concepts from popular science channels and sources.
- Educating the public on fascinating astronomical phenomena and putting it into perspective.
- Practice oral presentation skills in science for future careers.

Methodology

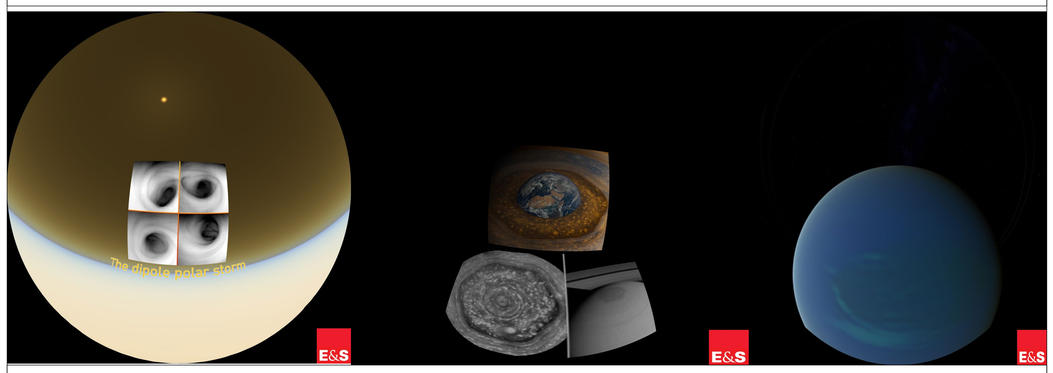
1) Write a script which tells a narrative explaining the visuals in great detail.
2) Research scientific papers, youtube channels, and previous coursework.
3) Collect images & clips from websites, videos, and scientific data that will be used for the planetarium shows.
4) Create a soundtrack playlist, where specific soundtracks can be played throughout the show to amplify the atmosphere and elicit an emotional response from the audience.
5) Explore the planetarium software functionalities and visuals to create a sense of adventure throughout the show.

Results

The Forecast of the Solar System



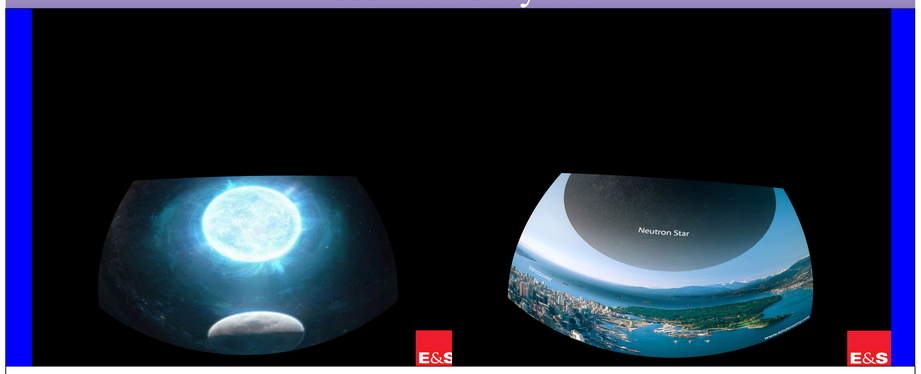
❖ Fig. 1. Snapshots of a) Precipitable water circulation; b) strongest recorded tornado and hurricane c) Venus's single Hadley circulation and Earth depiction.



❖ Fig. 2. Snapshots of a) Venus's dipole storm; b) Saturn's Polar Storm; c) Neptune's Great Dark Spot

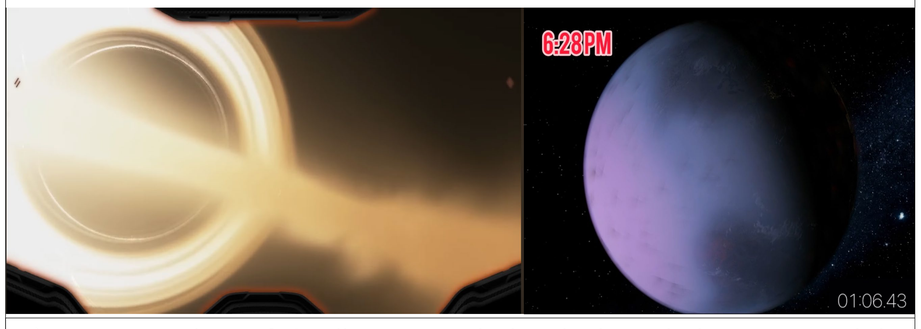
❖ Fig. 3. Snapshots of a) Jupiter's Great Red Spot Storm; b) hot Jupiter HD 189733B with red-hot glowing dayside and comet-like tail.

Cosmic Boneyard



❖ Fig. 4. Snapshots of a) A moon sized white dwarf with a greater mass than the sun; b) a city sized neutron star twice the mass of the sun.

❖ Fig. 5. Snapshot of a Surface Point of View of a Neutron Star. Note the relativistic effects and blue shifting of the surrounding light of the universe occurring on the surface, caused by the extreme gravity and density affecting spacetime.



❖ Fig. 6. Snapshots of a) Falling into a Black Hole through the accretion disk; b) Earth's oceans boiling away into the atmosphere moments after replacing the sun with the most luminous star.

Summary & References

❖ Challenges:
- Applying meteorological concepts to lesser understood planets.
- Comparing the conditions of other planets to Earth's.
- Timing the music/wind sound effects to the scenes in the show.
- Putting the extreme nature of stellar objects into perspective
- Simulating a scenario of the sun being replaced by the most luminous star in real time.

- Images within the show are taken from Google.
- Digistar 7 software is developed by the Evans & Sutherland COSM Company.

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