Project Description: Scientifly :An Interactive Learning Web Interface for Exoplanetary Sky Visualization

**1. Team Name:**

**Scientifly  
  
Team Members:**Team leader

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**2. Project Name:**

ExoCosmic Odyssey

**3. Which Challenges did you pick and why?**

We selected the challenge of visualizing the night sky from the perspective of exoplanets. The challenge involves using star catalogs to simulate how the stars would appear from different exoplanets. We picked this because it aligns with our goal of creating a learning tool that fosters curiosity about astronomy and allows students to engage in hands-on, creative exploration by drawing their own constellations. This project connects scientific discovery with imaginative learning, offering a unique perspective beyond Earth’s skies.

**4. What are your solutions?**

Our solution is to build an interactive website that allows users, especially students, to:

* Select from a range of exoplanets discovered by NASA, crucially utilizing the NASA Exoplanet Archive and other space missions and present high-quality image of the planets.
* Visualize a realistic sky from these exoplanets based on real star catalog data, particularly Gaia DR3 star catalog showing stars with accurate positions and brightness.
* Offer an interactive experience where students can create their own constellations and name them. Besides, using imagination and pasting through drawing, they can also create their own stellar or planetary systems, name those, speculate distinct characteristics and therefore create their own “Exosky”
* Provide the ability to explore exoplanet encyclopedia featuring gist over different exoplanets.
* Incorporate different viewing modes, on the basis of learner’s age, for beginner(showing stars details, images and other basic information) and for advanced learners(showing ecliptic/galactic view of stars through imagery visuals, showing the positioning a particular star within a finder chart or sky map)

**5. What will you make?**

We will create an interactive educative web app where users can:

* View the night sky from various exoplanets.
* Providing a separate encyclopedia section for the enthusiasts to learn more about different exoplanets.
* Interact with the star chart to explore different regions of the night sky. Then explore a wide range of constellations with details to their distinct stars and providing separate learning guide for beginners and advanced learners.
* Draw constellations and add their own names and descriptions. Also, enabling the user to draw customized planetary or stellar systems and putting different levels of characteristics and overall helping them to prepare their own exosky.

Showing different educational overlays (e.g., star names, brightness, constellations). This tool will enhance learning by offering an engaging, immersive experience, making the vastness of space more relatable and interactive.

Our team, Scientifly, is developing an interactive educative website that allows students to experience and visualize the night sky from the perspective of various exoplanets. The challenge we are solving is to enable users to select an exoplanet and view a unique star chart based on that planet's location in the galaxy, translating millions of stars from Earth-based catalogs to the perspective of an observer on the exoplanet.

**Key Features:**

1. Exoplanet Selection: Users can choose by taking reference from a database of over 5,500+ discovered exoplanets from the NASA Exoplanet Archive. Each selection shifts the user's perspective to the sky as seen from that specific exoplanet.
2. Interactive Star Chart: The website will display the perspective view of stars from different exoplanets using the latest star catalogs (e.g., ESA Gaia's DR3). The stars will appear brighter or dimmer depending on their distance and position relative to the chosen exoplanet.
3. Constellation Drawing: Users can interactively draw their own constellations by connecting stars visible in the exoplanet's night sky. They can name the constellations, just as our ancestors did from Earth.
4. Creating own Exosky: The user can draw and create own exoskies after having a wide-range insight over the extraterrestrial and stellar systems with their customizable parameters.
5. Visual Overlays: For advanced users, the interface will include options to present various grids, such as equatorial and galactic coordinates, or additional data about each star (e.g., star names, brightness, spectral type).

**Target Audience:**

The primary users will be students at the elementary, middle, and high school levels. The platform will offer different levels of complexity and detail to cater to varying age groups and educational needs. Teachers and space enthusiasts can also use this platform for learning and exploration.

**Educational Goals:**

This tool aims to foster a deeper connection between students and the universe, helping them visualize the vastness of space from different perspectives. It introduces them to key concepts in astronomy, such as star brightness, stellar movement, and the unique perspectives provided by exoplanets. Additionally, by allowing users to create and name their own constellations, we encourage creativity and personal engagement with space science.

This project aligns with educational standards that promote STEM learning through interactive technology, helping students grasp complex concepts in an accessible and enjoyable way.