Planetarium/Star Show: 
*Explorers of Mauna Kea*

**Description:**
This program explores the geological origins of the Hawaiian Islands and specifically of Mauna Kea, as well as the mountain’s cultural significance. Students participate in an activity that demonstrates how the 36 mirrors of the Keck telescope are able to work together to collect light.

The program also explores the unique set of factors (from its clear skies to its tropical location) that make Mauna Kea one of the best observatory sites on earth.

Audiences learn about the legend of Pele, Hawaiian goddess of the volcano, and Poli’ahu, the goddess of snow, and how various types of telescopes work. Four active scientists, who are currently exploring the universe from Mauna Kea, discuss their work and recent findings about the cosmos.

The show includes a live customized Digistar tour of the current evening sky and basic astronomy lessons.

**Basic Information:**
- **Age Level:** General Audience (Grades 6-12)
- **Maximum participants per session:** 210
- **Location:** Planetarium Theater
- **Running time:** 44 minutes (add 15-20 min. for Star Walk)

**Key Concepts Covered:**
- Native Hawaiian legends about the formation of their islands.
- A geological history of the Hawaiian Islands.
- The arrival of humans on Hawaii.
- The large complex of observatories atop Mauna Kea, representing universities and research organizations from various countries.
- A brief history of telescopes.
- Operations of large reflecting telescopes, including the latest designs using new technologies.
- A hands-on audience-participation activity to demonstrate the action of a segmented telescope mirror.
- Views of planets and comets and of deep space objects – galaxies, nebulae, supernovae --
taken by Mauna Kea instruments and the Hubble Space Telescope.

- A live planetarium show featuring the current night sky, with identification of stars, planets, and constellations.
- Four scientists at work on various different research projects at Mauna Kea and some of their discoveries.

**Sunshine State Standards Addressed:**

**1st Grade:**

**Big Idea #5 - The Earth in Space and Time**

- 1.E.5.3 Explain how magnifiers make things look bigger & allow us to see things not visible to our eyes alone.

**3rd Grade:**

**Big Idea #5 - The Earth in Space and Time**

- 3.E.5.5 Explain that many more stars are visible in a telescope than can be seen with eyes alone.

**Big Idea #10 – Forms of Energy**

- 3.P.10.4 Demonstrate that light can be reflected, refracted and absorbed.

**4th Grade:**

**Big Idea #6 – Earth Structures**

- 4.E.6.5 Investigate how technology and tools help to extend the ability of humans to observe very small things and very large things.

**7th Grade:**

**Big Idea #10 – Forms of Energy**

- 7.P.10.2 Observe and explain that light can be reflected, refracted and/or absorbed.

**9th – 12th Grade:**

**Big Idea #5 - The Earth in Space and Time**

- 912.E.5.8 Explain how historical tools as well as new observational tools utilize electromagnetic radiation.

**Big Idea #10 – Forms of Energy**

- 912.P.10.22 Construct ray diagrams and use thin lens and mirror equations to locate the images formed by lenses and mirrors.