

Student Teaching/Training in Astronomy, Geology, and Earth System Science (STAGES)

Mission and Goal:

> To best use the upgraded planetarium projection unit and software, the Department of Geology and Meteorology at Kean University is developing select demonstrations and shows for grade levels K-12 and the general public with the intention of increasing awareness and comprehension of earth system issues through an earth systems science approach.

> Our goal is to develop creative and innovative programs for learning that takes teaching "outside of the classroom" into a more visual format for students.

Cutting Edge Technology

...Digital STARLAB!!

The Standard System

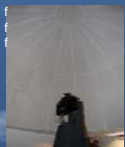


Courtesy of Digital STARLAB

Starry Night Small Dome™ Software Highlights

- > Complete 3D Hipparcos, Tycho 2 and database of 16 million stars available for visualization and animation
- > Thousands of famous deep space objects with detailed descriptions from Messier and Caldwell catalogs, Herschel catalog of 400 deep sky objects, and corrected NGC/IC catalogs with over 13,000 deep sky objects
- > Continuously updated comprehensive database of known satellites, comets, asteroids, meteor showers, and extra-solar planets
- > Display of planets and all known solar system moons as quality textured, accurately placed 3D objects
- > Accurate annual motion of planets, sun and moons over a +/- 100,000 year span
- > The ability to follow space missions in real-time
- > Constellation overlays, equatorial, galactic and ecliptic grids
- > Automatic navigation to any planet, moon, comet, asteroid or satellite in the database
- > Customizable high-resolution 360-degree panoramas
- > "Find" command to locate any celestial object
- > Compatible with Starry Night desktop versions

The Kean University System



The Planetarium

Projection Dome

by William C. Heyniger, Paul J. Croft, Jacqueline Parr, and William Moore

Creativity
Inspire
Methodology:

The mission of an educator is to equip students with the life-long skills of problem-solving, decision-making, and creativity which they may implement through a step by step process to facilitate student learning.

To do so effectively, the material will be provided according to the NJCCCS (New Jersey Core Curriculum Content Standards) as a guide. The shows and demonstrations will be separated by age groups to the advantage of the individual learner in any grade level.

Blast-Off



...embark on an educational mission to the outer limits of space.

Heat Down

Grades K-4 Objectives: For students to comprehend the fundamentals of day and night, that the sun provides Earth light and heat, and how we see the Solar System relative to the basic observations during our diurnal path. Stars are discussed as basic and unchanging with respect to their position with constellations and scattered with different levels of brightness.

Diorama: The use of objects and conceptual references will be used to further illustrate these concepts. For example, create a model town which includes buildings, plants, and people and have the participants identify, by using a flashlight, the effect that light has on the town (i.e. flashlight "on" simulating daytime and flashlight "off" simulating nighttime). After each activity foster a discussion with a series of questions that will reiterate the demonstrated concepts.

Grades 5-8 Objectives: For students to comprehend the fundamentals of the Earth, Moon, Sun System, and Planetary motions/ characteristics as well as observing how stars vary from each other in their composition (such as brightness, size, and color); and the comprehension of short and long-term changes in the night sky with regard to constellations, stars, the moon, and other astronomical objects. Comprehension of how the Earth's tilt, rotation, and elliptical orbit influence the seasons and weather patterns and how these orbital parameters can change over long periods of time.

Diorama: By using a New Jersey tidal table, the participant is guided in identifying how the moon's gravitational pull has an affect on our oceans and local tides. These factors could result in beach erosion and change in the land's habitat.

Grades 9-12 Objectives: For students to comprehend the fundamentals of scientific theory of the origin and evolution of the Universe (i.e. "Big Bang Theory" with both the "Open and Closed" Universal theories). Participants also explore the characteristics, development, and motion of stars which is relevant to the comprehension of Stellar Evolution. By identifying data collection and observation technologies which are crucial for astronomical research, participants explore opportunities and limitations of technology with regard to physics.

Diorama: Providing participants with the resources and tools to further explore theories in depth relative to the technology which is provided with a "high-tech, digital" age. Such resources are The Hubble Telescope and Satellite Imagery.

Public View Objectives: For participants to comprehend what advancements are being made by organizations worldwide and how they are being achieved for further Space Exploration. This includes organizations such as NASA which are exploring Mars and other universal activity. By demonstrating the fundamentals of astronomy and it's purpose in the Earth System, participants acquire the capability to comprehend how astronomy is an integral part in our every day observations.

Diorama: Providing resources which can further reiterate elementary concepts with "high-tech" resources such as exploring government organization websites.