

*Comets, Asteroids, Meteors*  
***GREAT BALLS  
OF FIRE!***



## Description of Components in the *Great Balls of Fire!* Exhibition

Visitors to this 3,000-square-foot exhibition can explore four thematic areas: Origins, Asteroids, Comets, and Impacts. The exhibition includes a variety of interactive multimedia experiences, ranging from straightforward computer-based activities to a larger scale, asteroid-shaped “pod” that showcases visitors’ role as “explorers” – a role that threads throughout the exhibit. The following is a list of exhibit components and brief descriptions.



### Origins

#### 1.01 Entry Sign.

**1.02 Origins Intro Panel.** In addition to planets and moons, the solar system contains smaller objects—asteroids and comets—that are usually found in specific regions. The panel introduces the idea that Earth is at risk of a future impact.



**1.03 Asteroid Encounter.** This is an immersive experience for visitors to engage in an interactive, role-playing activity. It includes visualization of the formation of the Solar System with a focus on why asteroids and comets formed, where they can be found, and how they periodically impact planets.



## Asteroids

**2.01 Asteroids Intro Panel.** This panel provides an overview of asteroids, including a diagram of their primary locations in the Solar System. Visitors learn how close NEOs (near-Earth objects) sometimes come to Earth.



**2.02 Itokawa Asteroid Model.** A large replica of the Itokawa asteroid rotates with a model of the Hayabusa spacecraft on its surface. Rail panels and an embedded video describe the Hayabusa mission to and from Itokawa, and explains why this asteroid was chosen.



**2.03 Itokawa Asteroid Video.** This video describes the Itokawa Asteroid, tells the story of the Hayabusa mission to it, and shows the types of near Earth asteroids.

**2.04 Blink Comparator Computer.** Visitors will use the method astronomers employ to find asteroids and comets moving among the stars. They will align two photographs of the night sky and then “blink” the images to find the asteroid in the star field image. Through an arrangement with the Smithsonian Center for Astrophysics, visitors can also request that the center’s automated telescope take photographs that night and email them to the visitor the next day. There is no cost (to museum or visitors) for this service.



**2.05 Light Curves Interactive.** Using a light sensor pointed at a rotating model of an asteroid, visitors generate an asteroid “light curve” in real-time, employing a process similar to one used by scientists. Experimenting with the light sensor and the irregularly shaped and moving asteroid models shows how the light curve changes and demonstrates the difficulty of determining the shape and movement of an object from a few pixels of light.



**2.06 Light Curves Computer.** Visitors try to figure out which of four rotating virtual asteroid models would create the light curve graph being shown on the screen.

**2.07 Rubble Pile Simulation Computer.** On a computer-based simulation, visitors attempt to save Earth from an impact by moving an asteroid with bombs and rockets while trying not to break it into pieces.



## Comets

**3.01 Comets Intro Panel.** The panel provides an overview of comets and key facts about them, including diagrams of the Oort Cloud and Kuiper Belt.

**3.02 Tempel 1 Comet Model.** This is a model of Tempel 1's nucleus; its coma is shown in the accompanying graphics. The rail has several content panels and an embedded video about the Deep Impact mission to Tempel 1.



**3.03 Tempel 1 Comet Video.** The video features an animation of a comet going from the Kuiper Belt to the inner Solar System, showing how the coma and tail develop.

**3.04 Comet Observations Story Panels.** A display of art and artifacts tells the story of comet observations throughout human history that makes connections to modern science wherever possible. Also included is a video of the Jupiter impacts and an engineering test model of a Whipple Shield from the Stardust mission.

**3.05 Sizing Up Shooting Stars Display.** Replica meteoroids of various sizes are placed on a graphic panel of the Leonid meteor shower. Visitors are asked to select one that's the size of the average rock in a Leonids meteor event. Lifting a panel reveals the surprising answer.



**3.06 Amateur Astronomer Cards.** Visitors can obtain cards from a custom printer that list upcoming events related to asteroid and comet research, including meteor showers, local

amateur astronomy meetings, and NASA mission happenings. The content can be updated easily using a Web interface.

## Impacts

**4.01 Impacts Intro Panel.** The panel provides an overview of impact sites around the world.

**4.02 Barringer Crater Model.** A model of the Barringer crater with rail graphics and a computer display combine to tell the story of how Gene Shoemaker proved that an object from space (and not a volcano) caused the crater.

**4.03 Barringer Crater Computer.** Visitors can view a slow-motion simulation of the impact that created Barringer crater and use a custom interface from Google Earth to view the top 30 craters in the world.

**4.04 What If It Hit My Town? Computer.** Visitors select the size of an asteroid or comet and then enter the zip code of a place for the impact. The results appear on a Google Maps display. A second screen shows an animation of the impact with cross-sectional simulations.



**4.05 Water Impact Test.** This mechanical device allows visitors to shoot a small projectile into water. A high-speed camera captures the impacts, which can then be played back in slow motion, demonstrating how even small objects can release a lot of energy on impact.

**4.06 Projectile Tests Video.** Visitors can access video of high-speed projectile tests conducted by scientists. Nearby are an artifact target and projectile with text comparing the speed of the test projectiles to that of the comet Shoemaker-Levy 9.

**4.07 Is It a Rock or a Meteorite?** Visitors examine a collection of rocks and use a series of tests (magnetism, color, density/relative weight) to determine which one is a meteorite. They can also touch a 22 pound metallic meteorite that impacted Earth 4,500 years ago, in what is now Buenos Aires, Argentina.



**4.08 “Messengers From Space” Display Case.** Visitors use a magnifying glass to examine a collection of real meteorites, Libyan glass, microtektites, shocked quartz, and two meteorite cross-sections. Each specimen is linked to a specific Earth crater and time period. A host venue may augment the exhibition by displaying its own meteorite collection or that of a local collector or institution.

**4.09 Science Fact or Science Fiction Computer.** Visitors watch clips from a variety of movies and television shows and then answer the question, “Did they get the science right, partially right, or wrong?” Their answers are compared to those of scientists and previous visitors.



**4.10 What Are the Odds? Quiz and Feedback.** Using a fast-paced quiz show format, one or two visitors can take a quiz about the risk of various events happening, including an asteroid or comet impact. There's also a mechanism for visitors to express their thoughts about a future impact.

**4.11 Comparing Craters.** This graphic panel shows impact craters throughout the Solar System.

**4.12 Facilitation Cart.** A partner on the project, the New Mexico Museum of Natural History and Science, developed this cart and activities with input from a group of middle school students, and the Astronomical Society of the Pacific. Activities include: Sorting the Solar System, Scaling the Asteroid Belt, Craters on the Earth, Meteorite or Meteor Wrong, Asteroid Hunters, True/False fact cards, Asteroid Risk Game, and touchable models of asteroids.

