

# Exploring the Sky from the Earth **Advanced**

## Finding Meaning in the Sky

### Universe in Your Hands Gallery ① Lower Level



**Fact:** In medieval times, astronomy (and in some cases astrology) was an important area of learning for religious Christians and Muslims.



**Find and Try:** At least two types of tools people created to help them study astronomy. What are these tools called? What were they used for? How do they work?



**Think** about the type of tools we use to study astronomy today. How are our astronomy tools similar and different to the tools used in the medieval period? How did medieval peoples' understanding of the Universe affect the types of tools they used to study astronomy? Why do you think astronomy might have been valued in the Christian and Islamic religions in medieval times?

### Bringing the Heavens to Earth Gallery ② Lower Level

**Fact:** People use the sky to help them structure their communities and their religious practices, to help them know when to plant their crops, and to travel by sea.



**Find and Try:** One object on display in the gallery. Study it carefully.





**Think** about this object. What does the object look like? What is it called? How is it (or was it) used? Who uses (or used) it? How does it relate to the sky? What significance do you think this object has (or had) for people in the community that created it?







**Since ancient times, humans have looked at the Sun, Moon, planets and stars to help us order our communities, calendars and religious practices. As our tools for exploring the sky improve, our understanding of the Universe, and our place in it, changes. Use this guide to explore the ways humans look at the heavens from Earth, and how our changing views affect the way we see ourselves.**

## How to use this guide

**Fact**  This symbol represents a **fact** that you can use.

You'll see this symbol when you need to **find** something in the museum. **Find it!** 

**Think!**  This symbol is something to try, or something to **think** about.

Use these numbers and the maps on page two to find your way around.   

## Changing Views of the Universe

### From the Night Sky to the Big Bang ③ Lower Level



**Fact:** Until the 1600s, most people believed that the stars, planets, Sun and Moon all revolved around the Earth. The observations they made with their eyes and other senses proved this theory.





**Find and Try:** Orange replica of Galileo's telescope. Look through it at each "date" Galileo observed. Make a sketch of Galileo's observations of Jupiter and its satellites.




**Think** about Galileo's findings. Describe the motion of the satellites Galileo discovered. What implications did Galileo's findings have for the prevailing view of the Universe? How do you imagine people felt when they learned about Galileo's discovery?

### From the Night Sky to the Big Bang ③ Lower Level

**Fact:** Using mathematics, Nicholas Copernicus hypothesized that the Universe was helio-centric, or Sun-centered, not geo-centric (Earth-centered), as many people believed. 

**Find and Try:** Read about at least two other astronomers profiled in the gallery who used mathematics to make hypotheses. Who were they, and what did they do? 

**Think:** How did their mathematics influence their observations, and/or how did their observations influence their mathematical predictions? How do you think their discoveries might have influenced the field of astronomy? Based on their findings, what academic subjects do you think a modern astronomer might need to know to make discoveries today? 

# Exploring the Sky from the Earth Advanced

## Backyard Astronomy

### The Atwood Sphere ④

Lower Level



**Fact:** Groups of stars that appear to make pictures in the sky are called constellations. We see different constellations in the Northern hemisphere than we do in the Southern hemisphere. At different times of the year, different constellations are visible at different times.



**Find and Try:** Atwood Sphere. Take a ride. Make sure to check out the celestial sphere exhibits in the exhibit area.



**Think:** The Atwood Sphere used to be a teaching tool for Navy officers. Why do you think it was important for people in the Navy to learn about constellations? What technologies do you think are available to aid people in navigating ships today? Why do you think some constellations are only visible at certain times of the year?

### The Milky Way Galaxy Gallery ⑤

Upper Level

**Fact:** Our ancestors could see many more stars than we can see today. Light from streetlights, porch lights and other manmade sources leaks into the sky. This light pollution means that people in some big cities do not see more than 20 stars on a clear night.



**Find and Try:** "How Many is a Million." How does it make you feel to contemplate the number of stars in the Universe? Do you think this sculpture is a good way to visualize the number of stars one can see? Why or why not?

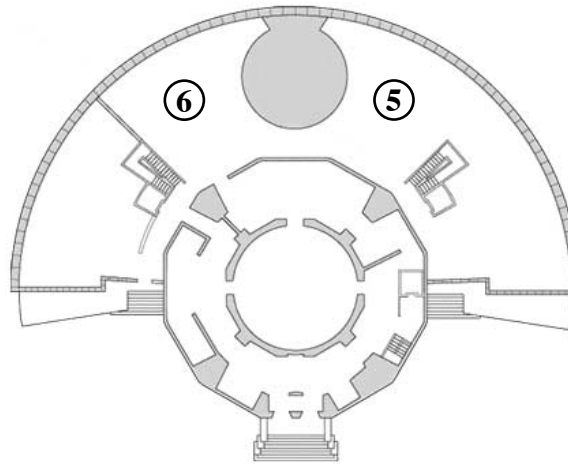


**Think** about what the stars mean to you. Long ago, before there was written history, all people told stories about the stars. Today, many people feel that stargazing is inspirational, and helps people remember that they are only a small part of the Universe. Have you ever seen the stars from a "dark skies site" away from city lights? If so, how did the experience make you feel? Do you think it is important for everyone to see lots of stars in the night sky? Why or why not? Some groups of people have convinced their cities to install different types of streetlights to decrease light pollution. Would you support such a measure if you were mayor of your city or town? Why or why not?

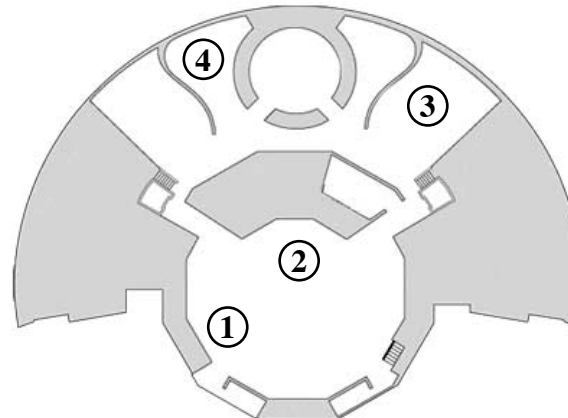


## MAPS

Upper Level



Lower Level



## New technology

### Our Solar System Gallery ⑥

Upper Level



**Fact:** Today we send up robotic explorers to take pictures and samples of planets and moons in our Solar System.



**Find and Try:** Virtual Visits—Adler Rover. Try driving it. Take a look at the planet models and think about which one you would like to visit.



**Think** about sending a robot explorer to another planet or moon. Which planet or moon would you visit? What type of questions would you like the robot explorer to help answer about the planet or moon? What type of equipment would your robot explorer need to answer your questions?

### The Milky Way Galaxy Gallery ⑤

Upper Level

**Fact:** Scientists examine celestial objects in different ways. Not only do telescopes "see" in visible light, like our eyes, but they also detect other wavelengths of light.



**Find and Try:** Sun dome. Look at images of the Sun in different wavelengths of light.



**Think:** Which wavelength of light would you choose to best "see" an object obstructed by clouds and dust? Which wavelength of light would you choose to use to find out the temperature of sunspots? Which wavelength of light would you use to figure out how much radiation an object emits?

