

## A Planetarium Guide for



This guide includes the following:

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- Resources on the Web
- *Arizona Skies* summary and objectives
- Astronomy investigations at Arizona Science Center
- *Arizona Skies* concepts
- How *Arizona Skies* corresponds with Arizona State Science Standards

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## Contact Information

Please contact us with any questions or comments! If there are any particular topics that you would like discussed during your show, please let us know after you have made reservations for the planetarium.

### **MIKE GEORGE**

**Director of Theaters Experience**

602-716-2079

[mikeg@azscience.org](mailto:mikeg@azscience.org)

### **Neil Goldstein**

**Planetarium Presenter and Coordinator**

602-716-2077

[goldsteinn@azscience.org](mailto:goldsteinn@azscience.org)

### **Sarah Tackett**

**Planetarium Presenter and Production Coordinator**

602-716-2075

[tacketts@azscience.org](mailto:tacketts@azscience.org)

# Resources on the Web

The Evening Sky Map  
<http://Skymaps.com>

Dome of the Sky  
<http://www.domeofthesky.com/clicks/constlist.html>

HubbleSite  
<http://hubblesite.org>

Solar System Exploration Page  
<http://solarsystem.nasa.gov/educ/>

Hands-on Universe  
<http://www.handsonuniverse.org>

Windows to the Universe  
<http://www.windows.ucar.edu>

StarChild  
<http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>

Thursday's Classroom  
<http://www.thursdaysclassroom.com/>

Astronomy Magazine's Intro to Astronomy  
<http://www.astronomy.com/asy/default.aspx?c=ps&id=6>

# Arizona Skies Summary

*Arizona Skies* provides students with the basics of stargazing. They will observe various constellations visible in the Northern Hemisphere and learn about some of the myths and stories associated with each. Major deep sky objects, different types of stars and the rotation of the Earth are also discussed. Students will be able to discuss how to find objects using their naked eye and optical instruments, such as a telescope or binoculars.

Objects visible in the night sky and topics discussed change depending on time of year and the presenter. Please let us know if there are any particular concepts that you would like presented.

This presentation is 45 minutes long.

Suitable for Grade 3 through adult.

# Features

- View several of the constellations as seen from Phoenix, Arizona
- Information on the North Star (Polaris)
- Discussion on movement of the night sky as the Earth rotates
- A brief look at and description of the Sun and any planets visible in the night sky
- Information on other objects in the night sky, including nebulae, star clusters, galaxies, etc.
- A Mobius strip “ride” at the end
- Ample opportunities to interact as this is a live presentation

# Objectives

At the end of *Arizona Skies*, students will be able to do the following:

1. Identify at least five constellations.
2. Relate some stories associated with the various groups of stars.
3. Locate the North Star (Polaris) and discuss movement of the sky.
4. Find planets visible in the night sky.
5. Locate various objects of interest (e.g. star clusters, nebulae, etc.) using either the naked eye or a telescope/binoculars.

# Astronomy Investigations at Arizona Science Center

Visit the funnel-shaped “Gravity Well” in the lobby. The shape of the gravity well mimics the effects that the gravitational pull of the Sun has on objects in our Solar System.

If you drop a coin down the Gravity Well, does it go slower or faster as it moves closer to the center of the funnel? Do you think planets move faster or slower when they are closer to the Sun?

Try making two coins go around in opposite directions. What happens if they collide? What could happen if two planets were to collide? Why don't planets collide?

# Concepts

*\*\*Topics discussed change depending on the presenter and the time of year. Please contact us if you would like any particular concepts addressed.\*\**

**Asterism:** A group of stars that is not considered an official constellation. Any other name for that group of stars is considered an asterism (i.e. the Big Dipper).

**Atmosphere:** A blanket of air (toxic or breathable) that surrounds some planets and moons. Clouds indicate that a planet has an atmosphere.

**Binary/Multi-star System:** A system of two or more stars. Our Sun is different from many stars in our galaxy because it is not part of a multi-star system.

**Constellation:** Any of the 88 areas into which the sky is divided. Originally, the constellations had no fixed limits and were just groups of stars that held some symbolic meaning for ancient cultures.

**Crater:** A large hole or depression in a planet or moon, formed from an asteroid or comet impact.

**Dwarf Planet:** A round celestial body that orbits around the Sun, has not cleared the neighborhood around its orbit, and is not a satellite.

**Galaxy:** A very large group of stars, gas, and dust that exists separately from other groups. Our galaxy is called the Milky Way.

**Gas Giant:** A planet that does not have a rocky surface. Gas giant planets have thick atmospheres that turn into dense liquids inside the planets. They may also have a rocky core.

**North Star:** Also called Polaris, this star is almost directly over the North Pole of the Earth. The North Star remains almost stationary in the northern sky as the Earth rotates. The North Star is not the brightest star in the sky.

**Nuclear Fusion:** The process occurring inside stars in which high pressure and temperature cause lighter elements to fuse together, forming heavier elements (e.g. hydrogen into helium)

**Planet:** A round celestial body that orbits around the Sun and has cleared the neighborhood around its orbit.

**Red Giant:** A large, relatively cool star in the final stages of its life

**Revolution:** The motion of the Earth and the other objects within the Solar System around the Sun. The Earth takes one year to revolve around the Sun.

**Rotation:** The spinning of an object on its axis. The Earth takes one day to rotate once.

**Solar System:** The system around our Sun, Sol, which consists of all of the objects that orbit it, including the eight planets and their satellites, dwarf planets and their satellites, asteroids, and comets. Some other stars have similar systems of objects that orbit them.

## Concepts (-continued-)

**Star:** A large object made of gas that gives off light. Our Sun is the star nearest to the Earth. Stars are bigger than planets; the smallest star would be about 100 times more massive than Jupiter.

**Supernova:** The explosion of a very massive star that has used all of its fuel and has become unstable.

**Terrestrial Planet:** A planet with a rocky surface, such as the Earth.

**White Dwarf:** The compact remnant of a moderately massive star that has used all of its fuel. Our Sun will become a white dwarf.

## Arizona State Science Standards Alignment

*Arizona Skies* includes information that meets the new Arizona State Science Standards as described below. Coding follows this system: SC06-S2C2-01 (Grade 6, Strand 2, Concept 2, PO1)

### Grade 5

SC05-S6C2-03: Distinguish between revolution and rotation.

SC05-S6C3-03: Describe various objects in the sky (e.g. asteroids, comets, stars, meteors/shooting stars).

SC05-S6C3-04: Describe the change in position and motion of the following objects in the sky over time: real motion – Moon, planets; apparent motion) due to the motion of the Earth) – Sun, Moon, stars.

SC05-S6C3-05: Explain the apparent motion of the Sun and stars.

### Grade 7

SC07-S6C3-05: Identify the following major constellations visible (seasonally) from the Northern Hemisphere: Orion, Ursa Major (Great Bear), Cygnus, Scorpius, Cassiopeia.

SC07-S6C3-06: Explain the relationship among common objects in the solar system, galaxy, and the universe.