

# C H A N D L E R S O L A R S Y S T E M W A L K

## 1 Intro to the Walk

Have you ever tried to imagine how large our solar system is? This walk was designed to help you gain a greater appreciation for the sizes of and distances between the sun and planets. It is a privately funded educational project created to further the public's understanding of science and astronomy through an entertaining and educational process. It was developed as a tribute to Howard Israel, an avid amateur astronomer. It was his hope that all those who experience the Solar System Walk would be motivated to ask more questions and seek more answers.

## 2 Our Solar System

Since ancient times, humans have studied the night sky, and some cultures kept careful records of their observations. They realized that a few stars moved in different patterns than all the others. As our knowledge grew, mankind realized that these wandering stars, and the earth, orbited the sun. More recent scientific study has brought us the theory of the "Big Bang," estimates on the age of the universe, and questions on how and when our solar system formed.

## 3 Our Sun

The sun is our giant nuclear furnace in the sky and supports all life on earth. Born from a vast cloud of spinning gas and dust billions of years ago, our sun is actually a common, mid-sized yellow star among trillions of other stars in the Universe. Modern telescopes and scientific instruments are enabling us to expand our knowledge of its composition and behavior. Its awesome power is seen in sun spots, the solar wind, flares and storms that often interact with the earth's magnetic field to create beautiful light shows that we in the northern hemisphere call Aurora Borealis.

## 4 Mercury

The closest planet to the sun is also the smallest planet in our solar system. Mercury is often called the swift planet because it orbits the sun in only 88 days. The planet's extremely thin atmosphere cannot hold in heat, causing it to bake on the sunlit side and freeze on the dark side, and resulting in the largest range of surface temperatures in the solar system. Mercury is sometimes visible on Earth's horizon just after sunset or before dawn with binoculars or even the naked eye, but it is always very near the Sun and difficult to see through the haze and dust in our atmosphere.

## 5 Venus

Aside from the Sun and the Moon, Venus is the brightest object in the sky. Over the centuries it has been known as both the evening star and the morning star. Scientists consider Venus to be a twin of Earth because of its many similarities, yet there are enormous differences. Perhaps the biggest difference is that Venus has a thick, hot, poisonous atmosphere that traps heat like a horticulturalist's greenhouse, resulting in a surface temperature hot enough to melt lead. These harsh conditions do not allow the surface of Venus to support life.

## 6 Earth

Earth is humanity's home planet, and the only place in the solar system and the Universe that we know life exists at this time. Earth's average distance from the sun, tilt of its axis, magnetic field, and the presence of liquid water on the planet's surface were critical factors in establishing a moderate and remarkably stable environment, which resulted in the development and evolution of a wide variety of life forms over many millions of years. Whether life could and does exist on worlds beyond Earth continues to be explored.

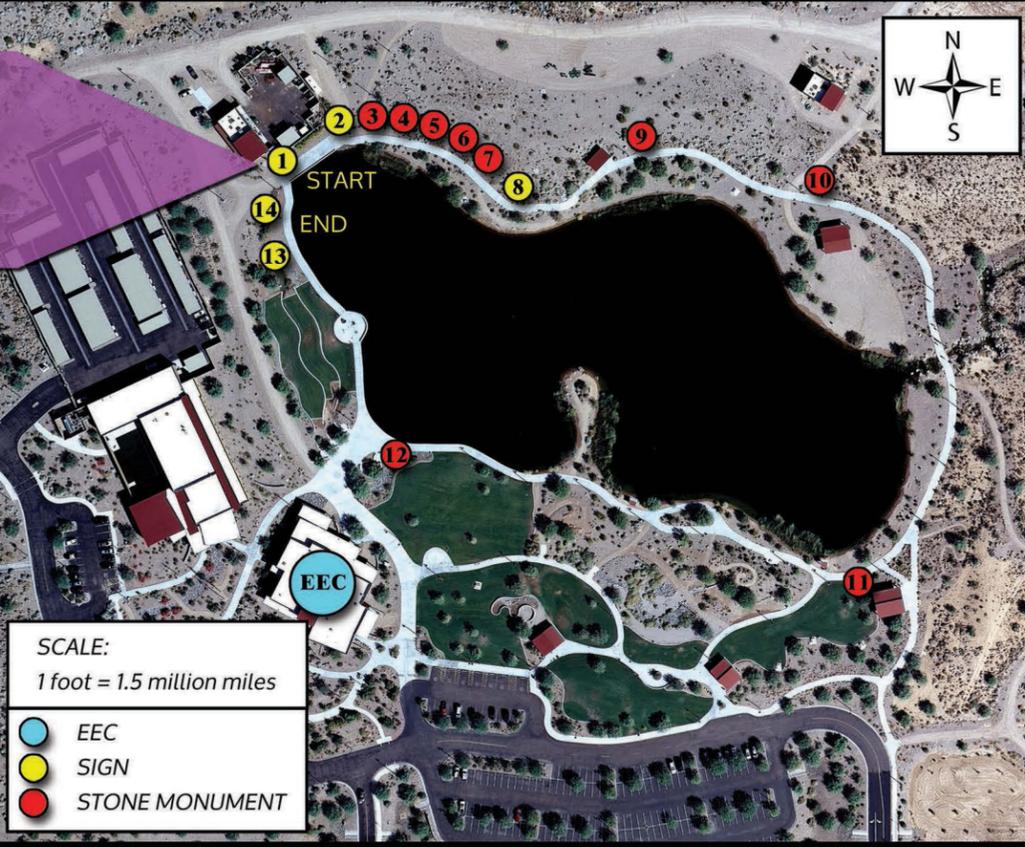
## 7 Mars

The Red Planet has an iron-rich, oxidized surface that gives Mars a rusty appearance. Recent exploration by robotic rovers and orbiters has confirmed the presence of water ice near the planet's north pole, and scientists have also observed signs of ancient floods. These discoveries lead us to question whether Mars is or could ever have been a habitat for life. The planet is also home to a massive volcanic mountain and a fracture in its rocky surface that is the largest canyon in the solar system.

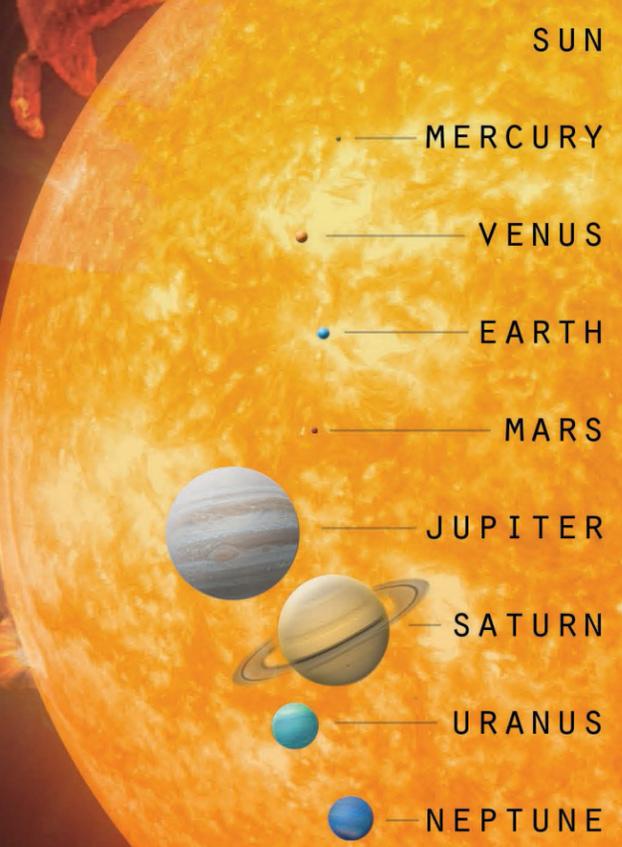
## 8 Asteroid Belt

Asteroids are rocky, irregularly shaped bodies too small to be considered planets that exist primarily in a band sitting between the orbits of Mars and Jupiter. Along with comets, asteroids were responsible for cratering the surfaces of planets and their moons early in the solar system's history. Depending on their size, larger asteroids or meteors can cause significant, even global, catastrophic consequences when they strike Earth. Smaller meteorites are often called "shooting stars" when they are seen as they burn up from friction with the atmosphere.

*Begin your journey*  
along the Chandler Solar System Walk at the northwest edge of the lake, approximately 500 feet north of the Environmental Education Center



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## 9 Jupiter

Jupiter is the largest planet within the solar system. The gas giant has no solid surface, yet deep under Jupiter's clouds is a huge ocean of liquid metallic hydrogen. Despite its size, Jupiter spins faster on its axis than any other planet. It has a colorful outer atmosphere with bands of thick red, brown, yellow and white clouds that are pushed by strong winds resulting in turbulent storms. One of these is the Great Red Spot, a giant spinning storm that has lasted for over 400 years. The planet has the most moons (66 discovered to date) of any other planet, including one that is larger than Mercury.

## 10 Saturn

The gas giant Saturn is the only planet in our solar system that is less dense than water. It is theorized that if you could build a large enough swimming pool, Saturn would float in it. Saturn's most striking feature is its ring system, discovered by Galileo Galilei in 1610. There are seven major rings, with the largest being 180,000 miles across, and countless smaller ringlets. They consist of countless chunks of dusty ice (ranging in size from dust particles to large boulders) that gently collide with each other as they orbit the planet. Saturn's largest moon, Titan, is also bigger than Mercury.

## 11 Uranus

Uranus (yoor-uh-nus) was the first planet discovered in modern history, when British astronomer William Herschel discovered it in 1781 with the aid of a telescope. It is a gas giant with the coldest atmosphere in the solar system; so cold that it is often called an "ice giant." It is likely a large body smashed into Uranus billions of years ago and knocked it over so much that it seems to stand on its side. Uranus also has a system of rings – not nearly as large as Saturn's – that were discovered in 1977.

## 12 Neptune

The planet furthest from the sun is Neptune, a twin gas giant of Uranus, with a frigid atmosphere of hydrogen, helium, ammonia, and methane, which gives both of these "ice giants" their blue color. Neptune has the strongest winds of any planet in the solar system, reaching 1,200 miles per hour, and its swirling atmosphere sometimes forms gigantic, visible storms. Neptune also has a faint and fragmented ring system. Neptune was discovered through mathematical prediction and not by visual observation, but it was first seen by telescope in 1846.

## 13 Dwarf Planets

Whatever happened to Pluto? Upon its discovery in 1930, Pluto was considered a planet, but more powerful and precise scientific instruments led to the discovery of objects in our solar system that challenged the standard astronomical classifications. In 2006, after new discoveries and much debate within the scientific community, the International Astronomy Union changed the definition of "planet" and added the new category of "dwarf planet." There are now officially five dwarf planets – Ceres, Pluto, Eris, Haumea, and Makemake – and more are likely to be discovered.

## 14 Outer Solar System

Far beyond the orbit of Neptune is the Kuiper Belt, containing several dwarf planets and thousands, possibly even millions of small bodies and comets in orbit around the sun. Much further beyond the Kuiper Belt sits a vast sphere known as the Oort Cloud, which may be home to up to two trillion icy bodies and comets. While in their orbits, these oddly shaped "dirty ice balls" are invisible to observers on Earth. But every once in a while, a comet will be thrown off of its orbit and hurled towards the inner solar system where it slowly melts in a fantastic show of light.

# HOW LARGE IS OUR SOLAR SYSTEM?

The Chandler Solar System Walk is a scale representation of the sun, planets and other objects in the known solar system, shrunk down to fit within the confines of Veterans Oasis Park. In this scale model, the sun is only 7 inches wide, Earth is about 1/10th of an inch wide, the largest planet Jupiter is about 3/4 of an inch wide, and the dwarf planet Pluto is much smaller than the tiny period at the end of this sentence.

The walk begins on the northwest side of the park lake with a sign that introduces the Solar System Walk, and other signs follow in a clockwise direction around the lake. Each foot you travel along the 2,500-foot pathway is relative to 1.5 million miles in space. From the monument for the sun, your stroll of nearly half a mile will represent a journey of roughly four billion miles to the edge of our solar system.

As you experience the Chandler Solar System Walk, you will gain a greater appreciation for the enormity of space. When you contemplate our star and the eight planets that comprise our solar system, remember that they occupy a tiny point in space within the much larger Milky Way, a spiral galaxy of more than 200 billion stars. And the Milky Way is only a single galaxy among billions and billions of other galaxies within the Universe.

# CHANDLER SOLAR SYSTEM WALK AT VETERANS OASIS PARK



# CHANDLER SOLAR SYSTEM WALK

The Chandler Solar System Walk is a privately funded educational project created to promote astronomy to park visitors. Dedicated in July 2012, it was designed and built with funds donated to the East Valley Astronomy Club (EVAC) by the family and friends of Mr. Howard Israel, an avid amateur astronomer and one of the first instructors at the park's Environmental Education Center (EEC) when it opened in 2008.

During his lifetime, Mr. Israel served as vice president of EVAC, and as Phoenix Section Leader for the International Dark-Sky Association. Over the years, he gave astronomy presentations at the Arizona Science Center, as a volunteer with Lowell Observatory in Flagstaff, during cruises on the high seas, and at the EEC. Mr. Israel had great affection for the people he taught at the EEC over the years and for the EEC staff. He hoped that the Walk would augment the ongoing mission of the Environmental Education Center.

The walk is intended to serve as a continuation of Howard's efforts to further the public's understanding of science and astronomy through an entertaining and educational process. Additionally it will serve as a lasting memorial to his spirit of curiosity, passion for discovery, and his legacy of sharing knowledge with people of all ages, so that they could gain a better understanding of humankind's place in the cosmos. His hope was that all those who experience the solar system Walk would be motivated to ask more questions and seek more answers.



HOWARD ISRAEL

The family of Howard Israel would like to acknowledge the support this project received from the staff of the City of Chandler Community Services Department and the members of the East Valley Astronomy Club.

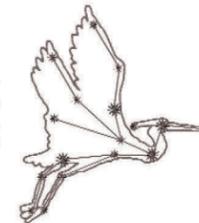
## Resources

The information in the Chandler Solar System Walk is based on history, mythology, and a consensus of scientific knowledge that was current as of June 2012. However, new discoveries are being made every day, and some of this information may change. Please consult additional source material for the most current and accurate data.

## Support Dark Skies

The creators of the Chandler Solar System Walk support the mission of the International Dark-Sky Association (IDA), which is to preserve and protect the natural nighttime environment and our heritage of dark skies through environmentally responsible outdoor lighting. Excessive and inappropriate artificial light is an increasing problem threatening astronomical facilities, ecologically sensitive habitats, all wildlife, our energy use as well as our human heritage. Light pollution can disorient wildlife and threaten natural migration, mating, sleeping and eating patterns. For more information, go to [www.darksky.org](http://www.darksky.org).

## CHANDLER SOLAR SYSTEM WALK AT VETERANS OASIS PARK



An astronomy education project created and funded by the family & friends of Howard Israel in partnership with the East Valley Astronomy Club and the City of Chandler Recreation and Parks divisions.



**Veterans Oasis Park**  
4050 E. Chandler Heights Road  
Chandler, AZ 85249

Visit the **FREE** Solar System Walk during normal park hours:  
6 a.m. to 10:30 p.m.

**Environmental Education Center**  
480.782.2890

The EEC hosts Star Parties, moonlight walks and other astronomy related events and classes. For details, visit:  
[www.chandleraz.gov/veterans-oasis](http://www.chandleraz.gov/veterans-oasis)

[www.chandlersolarsystemwalk.com](http://www.chandlersolarsystemwalk.com)  
[chandlersolarsystemwalk@gmail.com](mailto:chandlersolarsystemwalk@gmail.com)



## Thank you!

The Chandler Solar System Walk would not have been possible without the donors and partners listed below. It is because of their support that people of all ages will experience this walk and be inspired to learn more about science and astronomy.

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