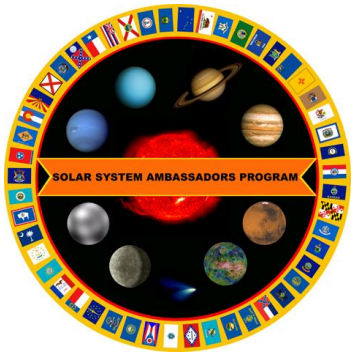
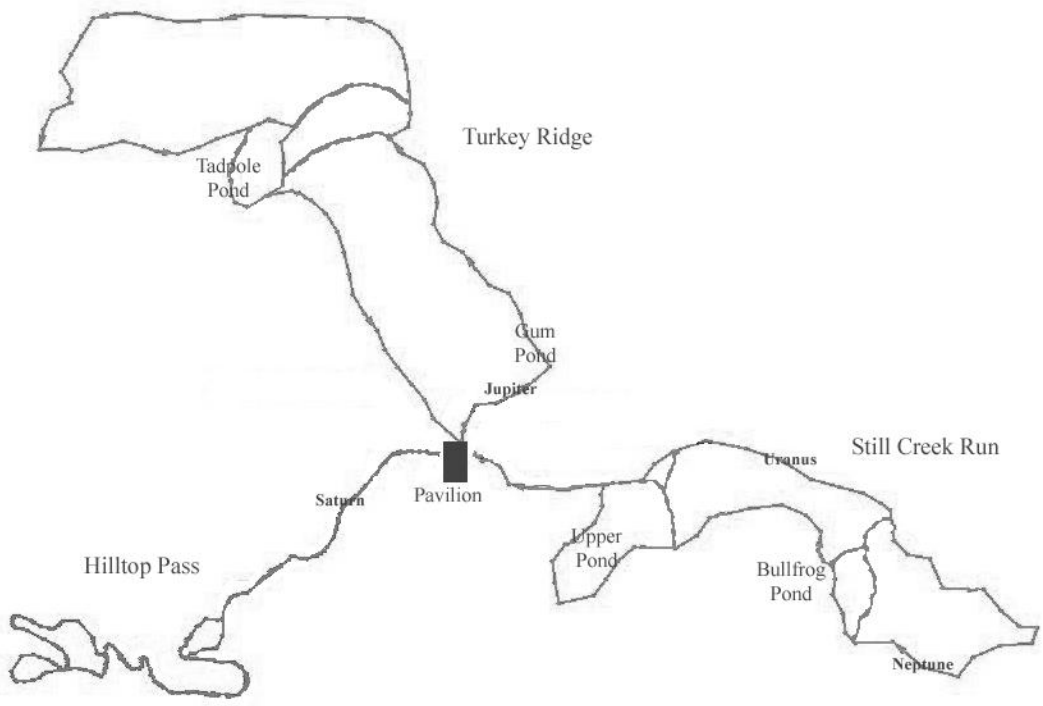
Solar System Stroll: Tour Book

A walk through a 1 kilometer scale model of our Solar System



Sol (our Sun)

The Center of our Solar System
Medium-sized star
One of more than 300 billion stars in our Milky Way galaxy
Diameter: 1,390,000 km or 864,000 miles
Surface Temperature: 5800 K or 9950˚ F
Contains more than 99.8% of the total mass of our Solar System
Made up of 75% hydrogen, 25% helium with traces of other elements
Rotation rate of 25.4 days at its equator and 36 days at its poles
Has 8 planets as well as many dwarf planets, asteroids & comets orbiting it
Studied continuously by numerous spacecraft:
Solar Dynamics Observatory, STEREO, SOHO



On this scale model, Pluto would be found at the intersection of
Lanark and Edgewood roads as you are leaving the Alabama Nature Center.

Note: the Sun is too large on this scale to include on the back of this guide. It would be approximately 9 inches (23 centimeters in diameter)

For comparison, the next nearest star at this scale would be over 4100 miles (6600 km) away.
(This is further than the center of the Earth is from you right now!)

Mercury

Closest Planet to the Sun
Solid rocky surface
Rotation Rate = once per 59 days
Revolution Rate = once per 88 days
    Solar day equals 2 of its years!?
Largest temperature variations in our Solar System
    Max of 425˚C (800˚F) & Min of -180˚C (-300˚F)
No moons
Currently being studied with the *MESSENGER* orbiting spacecraft

Average Distance to Sun: 58,000,000 km
Scaled Distance in a 1km Model: 9.7 m

Venus

2nd planet from the Sun
Very thick atmosphere of mostly CO_2 w/ sulfuric acid rain
Atmospheric pressure = 90 times Earth's
Rotation Rate = once per 243 days
Revolution Rate = once per 225 days
Surface Temperature = 470˚C (880˚F)
High winds of 360 kph (220 mph) at cloud tops
No moons
Currently being studied with the *Venus Express* orbiting spacecraft

Average Distance to Sun: 108,000,000 km
Scaled Distance in a 1km Model: 18 m

MERCURY

VENUS

Earth

3rd planet from the Sun
75% of surface is covered with water
Atmosphere of 76% Nitrogen, 21% Oxygen
Rotation Rate = once per 24 hours
Revolution Rate = once per 365 days (one year)
Home to all known plant and animal life
1 large moon

Average Distance to Sun: 150,000,000 km
Scaled Distance in a 1km Model: 25 m

Mars

4th planet from the Sun
Solid rocky surface: dust soil, contains iron oxide (rust)
Very thin atmosphere of mostly CO_2
Occasional global dust storms
Rotation Rate = once per 24.6 hours
Revolution Rate = once per 687 days
Max Temperature = -5˚C (23˚F) and Min Temperature = -87˚C (-125˚F)
2 small moons which are probably captured asteroids
Currently being studied by numerous orbiters and landers
jointly referred to as the *Mars Exploration Program*

Average Distance to Sun: 228,000,000 km
Scaled Distance in a 1km Model: 38 m


EARTH & MOON

MARS

Asteroids

Most orbit in a region between Mars and Jupiter (asteroid belt)
Irregular-shaped rocky hunks
Most asteroids in the stone and carbon categories
Less than 5% in metallic category
Largest (named Ceres) is one third the size of the moon
Over several hundred thousand discovered so far
All known asteroids lumped together = less than our moon
Dawn spacecraft currently orbiting Vesta, leaves soon for Ceres

Range for Asteroid Belt:
    Distance to Sun: 299,000,000 to 599,000,000 km
    Middle of the Range: 449,000,000 km

Scaled Range for Asteroid Belt: 50 to 100 m
    Middle of the Range: 75 m

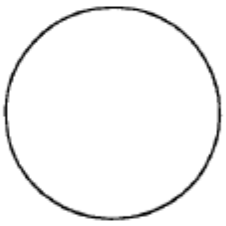
Jupiter

5th planet from the Sun
Largest planet, one of the "Gas Giants"
    Made mostly of Hydrogen and Helium
Rotation Rate = once per 9.9 hours
Revolution Rate = once per 11.8 years
Great Red Spot: giant storm
At least 50 moons
    Io: most volcanically active object
    Europa: ocean beneath frozen surface?
    Ganymede: larger than planet Mercury
    Callisto: extremely heavily cratered/ancient surface

Average Distance to Sun: 778,000,000 km
Scaled Distance in a 1km Model: 130 m

THE ASTEROIDS

JUPITER



Saturn

6th planet from the Sun
Second largest planet, one of the “Gas Giants”
Rotation Rate = once per 10.7 hours
Revolution Rate = once per 29.4 years
Impressive ring system
At least 53 moons
    Titan: thick atmosphere with liquids on surface
    Iapetus: 1 side bright as snow, other dark as coal
    Enceladus: active ice volcanism from “Tiger Stripes”
Currently being studied with the *Cassini* orbiting spacecraft

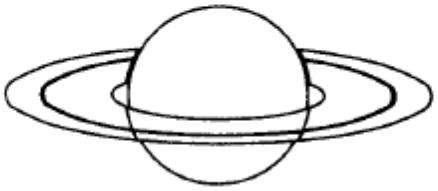
Average Distance to Sun: 1,430,000,000 km
Scaled Distance in a 1km Model: 238 m

Uranus

7th planet from the Sun
Slushy interior…”Ice Giant”
Only planet tilted nearly at right angle to its orbit
Rotation Rate = once per 17.2 hours
Revolution Rate = once per 84 years
Minimal atmospheric activity (clouds)
At least 27 small moons
    Miranda: complex surface indicates partial interior melting
Visited only by *Voyager 2* spacecraft

Average Distance to Sun: 2,871,000,000 km
Scaled Distance in a 1km Model: 478 m

SATURN



URANUS

Neptune

8th planet from the Sun
"Twin" of Uranus…slightly smaller
Bluish appearance due to methane in atmospheres
Rotation Rate = once per 16.1 hours
Revolution Rate = once per 164.8 years
Active atmosphere with high cirrus clouds
Extremely windy at cloud tops (1200kph / 750 mph)
At least 13 moons
    Triton: captured object, doomed to fall into Neptune
Visited only by *Voyager 2* spacecraft

Average Distance to Sun: 4,500,000,000 km
Scaled Distance in a 1km Model: 750 m

Pluto

Reclassified as a 'dwarf planet'
Smaller than our moon…smaller than the USA!
Receives very little light or heat
Atmosphere: freezes in winter
Rotation Rate = once per 153.3 hours (about 6.4 days!)
Revolution Rate = once per 247.9 years
At least 4 moons
    Charon: almost half the size of Pluto itself
New Horizons spacecraft will fly-by in July 2015
    launched in January 2006

Average Distance to Sun: 5,907,000,000 km
Scaled Distance in a 1km Model: 983 m

NEPTUNE

PLUTO & CHARON