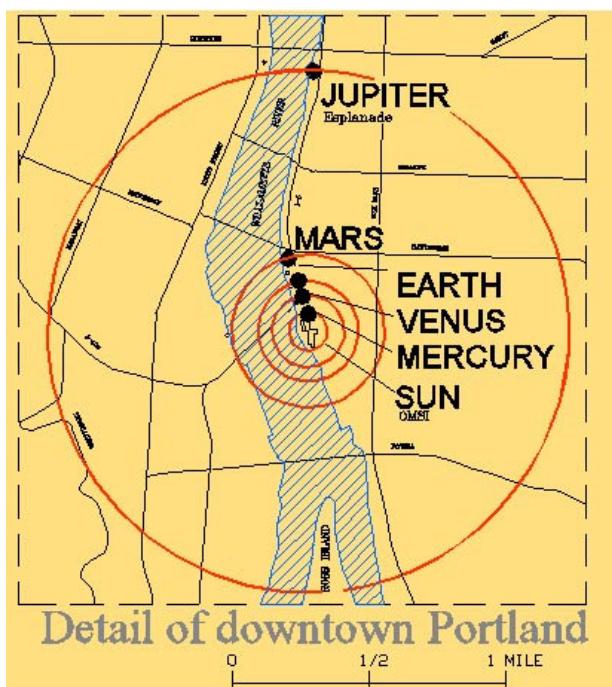


Self-guided tour of the Portland Solar System

A model of the Solar System has been constructed to scale in Portland, Oregon. The Sun and all the planets are shown to scale. The Sun is the orange chimney at OMSI, approximately 9 feet, 1 inch in diameter. The planets and our moon are spheres of mineral or concrete. They are placed throughout the city at scale distances from the Sun. The Portland Solar System covers 150 square miles in Portland.

Sites have been chosen for accurate scale distance from the Sun, as well as for scenic views of the city. Touring the Solar System in Portland provides both an experience of the immense distances and powerful gravitational forces of our solar system, and a sense of the variety and beauty of Portland landscapes and panoramic views.

The Sun and the first five planets can be seen on a walking tour. The remaining planets can be visited by car, bicycle, or bus.



The inner planets and Jupiter can be visited on a walking tour.

To start the tour, get yourself to OMSI, on the east bank of the Willamette River. From downtown, drive, walk or bike across the Hawthorne Bridge, or take the 83 bus from 5th and Salmon. If you use the bus for the tour, get a \$4 all-day pass at the Tri-Met ticket machine at Pioneer Square or 5th & Salmon. Hang on to the ticket, though, because every bus driver asks you to do something different with it.

Once at OMSI, walk to the Northwest corner of the generator building to see the small black plate identifying the sun. To see the chimney, which represents the sun, follow the curved pathway above

the riverbank to the Southwest corner of the generator building and look up.



The sun is represented by the chimney at OMSI and can be seen from all over the city.

SUN

- 864,000 miles in diameter
- In this model, The sun is represented by the chimney at OMSI, approximately nine feet in diameter
- The earth is one inch in diameter, 984 feet north along the Willamette River
- 93 million miles from the Sun to the earth

This scale model of the Solar System is constructed at a scale of 1:500,000,000, which means that one mile on the streets of Portland equals 500 million miles in space. Light will travel 500 million miles in about 45 minutes. The light from the sun takes about 8 minutes to reach Earth. If you walk slowly north along the east bank of the Willamette, at about 120 feet per minute, you will be traveling at the scale model version of the speed of light, arriving at the model of the earth in about eight minutes.

On the way to Earth, you'll first pass Mercury and Venus. 380 feet north of the sun at OMSI you'll encounter:

MERCURY



Mercury is a 1/3-inch diameter hematite.

- 3,030 miles in diameter
 - In this model, Mercury is about 1/3 of an inch in diameter
- 36 million miles from the Sun
- Mercury has no moons
- 86 days to orbit the Sun
- Mercury was known to ancient Chinese and Egyptians, though it is named for an ancient Roman deity
- In this model Mercury is located 380 feet north of OMSI on a Bridge pylon along the footpath by the Willamette River.

VENUS

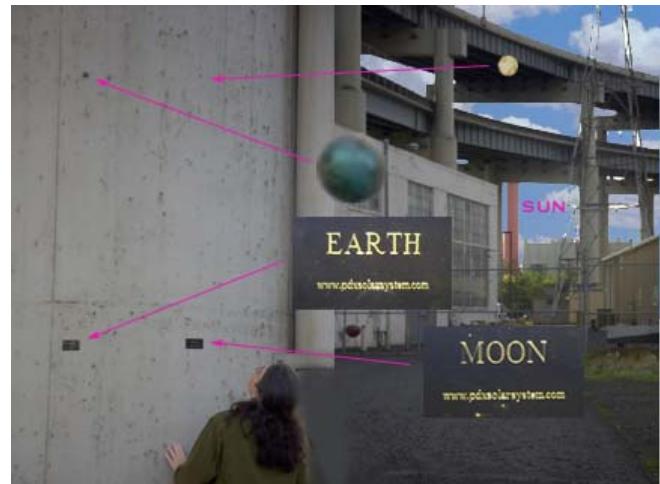


Venus is a one-inch diameter Turquoise, natural brown in color.

- 7,515 miles in diameter
 - In this model, Venus is a little less than an inch in diameter
- 67 million miles from the Sun
- No moons
- 225 days to orbit the Sun
- Also known as the Evening and Morning Star, Venus has been known since prehistoric times.
- In this model Venus is located 710 feet north of OMSI on a bridge pylon at the north end of the OMSI parking lot.

Continue your slow walk north, at the speed of light, and find the familiar:

EARTH and MOON



Earth is a one-inch diameter Turquoise. The Moon is a 1/4-inch diameter Pietersite, 30-inches from the Earth.

Walk another 330 feet to the north to find:

EARTH

- 7,920 miles in diameter
 - In this model, earth is 1 inch in diameter.
 - The moon is one-quarter inch in diameter, 30 inches away. That's it, just to your right.
- 93 million miles from the Sun
- 365 days, 6 hours, 9 minutes to orbit the Sun
- In this model Earth is located 984 feet north of OMSI. It is beyond the maintenance building north of OMSI, on a bridge pylon next to the asphalt road that runs through the gravel parking lot. To see the Sun, step back across the asphalt road.
- You can simulate a solar eclipse by holding a $\frac{1}{4}$ -inch object, such as a pencil eraser at arms length, approximately 30 inches.

Return to the footpath by the river and continue on to the last bridge pylon before passing under the Hawthorne Bridge. There you'll find:

MARS



Mars is a $\frac{1}{2}$ -inch diameter rutilated quartz.

- 4,220 miles in diameter
 - In this model, Mars is $\frac{1}{2}$ - inch in diameter.
 - Mars has two moons, Phobos and Deimos. You will have to imagine them in this model because they would only be one-thousandth of an inch in diameter; Phobos $\frac{3}{4}$ -inch away and Deimos 2-inches away.

- 140 million miles from the Sun
- 1 year, 10 months, 17 days to orbit the Sun
- In this model Mars is located 1,500 feet north of OMSI along the footpath next to the Willamette River.
- The real planet Mars can often be seen as bright, reddish spot in the sky at night. It has been known since ancient times. However, as telescopes developed and more details were seen, speculation grew about the possibility of intelligent life on Mars.

Pass under the Hawthorne Bridge and continue north along the east bank of the Willamette River. The recently constructed Esplanade will give you views of downtown Portland and activity on the River.

You are now passing through the asteroid belt. One asteroid has been installed. It is a bit of a detour, and you may wish to visit it later, on the way to Uranus.

About a mile north of OMSI, about 100 yards before the Burnside Bridge stairs, on your right you will find:

JUPITER



Jupiter is an $11\frac{1}{4}$ -inch concrete sphere. To see the sun, a mile away, climb the stairs to the Burnside Bridge, about 100 yards north of Jupiter.

JUPITER

- 88,800 miles in diameter
 - Jupiter has as many as 61 moons. For a table of the most prominent moons, and a link to more information, go to www.pdxsolarsystem.com.
- 483 million miles from the sun
- 12 years to orbit the sun
- Visible to the naked eye
- Jupiter has been observed since prehistoric times. It was the first planet observed by Galileo through the newly invented telescope.
- The four largest moons, Io, Europa, Ganymede and Callisto can be seen with binoculars and their movement around Jupiter can be observed.

To continue your journey through the solar system, either walk back to OMSI to pick up your car, or walk across the Burnside Bridge to 6th street to catch the 40 Tacoma bus, which runs every 30 minutes, or once an hour on Sundays. If you are on a bicycle, head south through Waterfront Park, past Riverplace to pick up the bike trail along the west side of the river.



Visiting the outer planets will take you through many scenic parts of Portland.

Go south on Macadam Boulevard through Johns Landing. Get off the bus or turn left at Nebraska St. to enter Willamette Park. As you enter the park, go to the right and find the parking lot and boat ramp. To the left of the boat ramp, behind the "Landscaping for Clean Rivers" garden, on a tall wooden pole, you'll see:

SATURN



Saturn is a 9 1/2-inch concrete sphere. The Sun can be seen 1 1/2 miles away.

- 75,500 miles in diameter
 - For a table of the most prominent moons of Saturn, go to www.pdxsolarsystem.com
- 885 million miles from the sun
- 29 1/2 years to orbit the sun
- Visible to the naked eye
- Known since prehistoric times
- Named after the Roman God of the harvest, Saturn can be seen with the naked eye. Through a small telescope, the rings can be seen, as well as the four largest moons, Titan, Rhea, Iapetus, and Dione.

Before continuing on, look east to Ross Island and you may be fortunate enough to see Great Blue Heron nesting in the trees or lurking over the river.

To get to Uranus, take the 40 bus back to downtown, and switch to a 15 Belmont, or drive north on Macadam into town, and cross the Morrison Bridge to Southeast Portland. You can detour left at 12th street to see the asteroid Ismene.

ISMENE



Ismene is five thousandth of an inch in diameter and located 4,500 feet from the Sun. It is shown on a 2-inch diameter brass plate next to the entry walk at 707 SE 12th, just north of Belmont SE. Sometimes it is covered with leaves or grass, but it is about midway down the walk, on the north side.

After seeing Ismene, continue east on Belmont to SE 69th. Walk or drive up 69th to Mount Tabor Park(closed to vehicles on Wednesday), turn right and go up the hill to the stop, left at the stop sign, wind your way past the playground to a parking spot. Leave your car, go up the stairs to the left of the parking lot to the non-vehicle road at the top of Mount Tabor. Go to the right, and you will find Uranus on the third pole, overlooking Portland.

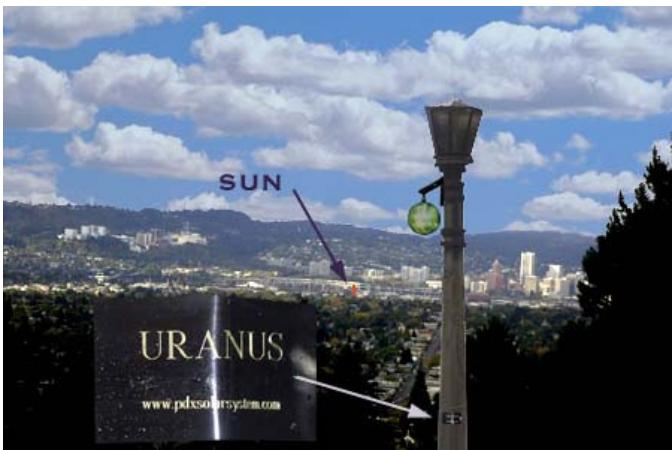
URANUS

- 31,700 miles in diameter
 - In this model, Uranus is 4 inches in diameter
 - The moons of Uranus are named after either characters in Shakespeare or the wives and cars of Mick Jagger. For the moons of Uranus see the table at www.pdxsolarsystem.com
- 1,780 million miles from the sun
- 84 years to orbit the sun
- Uranus was discovered in 1781 by William Herschel using a homemade telescope. Uranus is unusual in that its rotation is tilted about 90 degrees from its plane of orbit.

Mount Tabor is a heavily wooded extinct volcano with a magnificent view of Portland between the trees.

To travel to Neptune, retrace your steps to 69th and Yamhill, and continue east on Yamhill, (15 bus) which jigs and jogs on its way to 76th. Go left on 76th, right on Washington, left on 82nd, and enjoy the magic that is 82nd Avenue.

URANUS



Uranus is a 4-inch concrete sphere. The Sun can be seen 3 1/2 miles away.

Head north on 82nd (72 bus) about 2.2 miles to Fremont Street, which is marked with two large green signs, one for the Portland Bible College and the other for Honeysuckles Lingerie. Go right on Fremont,(33 bus) veer right at 89th on Benjamin, then right on 92nd and on to the stop sign at Russell. Go left up hill just past Russell. Continue up the hill for 1 1/4 miles, passing through the figure-8 tunnel (hey, you're inside a volcano for about 30 seconds). At the end of the road park at the Rocky Butte Castle, and walk up the ramp or stairs to find:

NEPTUNE



Neptune is a 3 7/8" concrete sphere. The sun is just barely visible 5.6 miles away

- 30,500 miles in diameter
 - For the moons of Neptune see the website, www.pdxsolarsystem.com
- 2,790 million miles from the sun
- 165 years to orbit the sun
- The discovery of Neptune was predicted by John Couch Adams in 1845 based on irregularities of the orbit of Uranus (remember the 4 inch sphere 4 miles away on Mt. Tabor?) The actual discovery one year later was credited to LeVerrier.

From the top of Rocky Butte you have some of the most spectacular views in Portland. Mountains that can be seen include Rainier, St. Helens, Adams, Hood, and Jefferson. The Columbia River extends far in to the Gorge to the east, and meets the Willamette to the west. You look down on planes landing at Portland International Airport, and see the bridges and buildings of Portland, as well as the orange chimney at OMSI.

Leave Rocky Butte on the road 100 yards to the right of the one you arrived on. This road will get you back to Fremont and the 33 bus. Head west on Fremont, through some recently revitalized neighborhoods. After about 5 miles, go right on Williams(40 bus), left on Killingsworth, right on Vancouver, and left on Portland Blvd. Follow Portland to the end and go right on Willamette Blvd. It curves around the bluff above the Swan Island Shipyards, and turns right at the University of Portland. Enter at the main entrance, and try to find a parking spot near the bluff. Walk on the

grass towards the west and find the gazebo next to the small, observatory building. Inside the gazebo, you'll see:

PLUTO AND CHARON



Pluto is 1/4" diameter Chrisoprase. Charon is a 1/2" diameter Chrisoprase. The Sun is 5 1/2 miles away, hidden by a bend in the river.

- 1,920 miles in diameter
- 3 billion, 700 million miles from the Sun. The orbit of Pluto is tilted to the plane of the other planets, and also eccentric. Sometimes, as in this model, Pluto is closer to the Sun than Neptune, crossing its path.
- 247 years to orbit the Sun
- Pluto was discovered in 1930 by Clyde Tombaugh. He used a relatively new technique of comparing photographs of the same area of the sky taken at different times.
- The moon Charon is sometimes considered a twin planet with Pluto
 - The moon Charon is 807 miles in diameter, 11,800 miles from Pluto
 - In this model, Charon is less than 1/8 of an inch in diameter, 1 1/2 inches away from Pluto
 - Charon and Pluto orbit each other every 6 days, 9 hours and 36 minutes
 - Charon was discovered in 1978

Now that your tour has ended, return to Portland via Willamette Blvd, to Portland Blvd to I-5 south, or on the 40 bus.