

# The SAGATUG

# INTERFACE

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The San Gabriel Valley Technology User's Group. The Club for TRSDOS and MS-DOS

## Mars Closer Than in 60,000 Years

*Reprinted from NASA's Jet Propulsion Laboratory web site.*

Living too close to a neighbor may not be very appealing, but when Earth's neighboring red planet moves closer than it's been in 60,000 years, observers expect nothing but acclaim.

Scientists and amateur astronomers will benefit from the spectacular view of Mars this August as it appears bigger and brighter than ever before, revealing its reflective south polar cap and whirling dust clouds.

On August 27, 2003, the fourth rock from the sun will be less than 55.76 million kilometers (34.65 million miles) away from the Earth. In comparison to the space between your house and your neighbor's yard, that may seem like a large distance, but Mars was about five times that distance from Earth only six months ago.

"Think of Earth and Mars as two race cars going around a track," said Dr. Myles Standish, an astronomer from NASA's Jet Propulsion Laboratory, Pasadena, Calif. "Earth is on a race track that is inside the track that Mars goes around, and nei-


ther track is perfectly circular. There is one place where the two race tracks are closest together. When Earth and Mars are at that place simultaneously, it is an unusually close approach, referred to as a 'perihelic opposition'."

Opposition is a term used when Earth and another planet are lined up in the same direction from the Sun. The term perihelic comes from perihelion, the point of orbit in which a celestial body is closest to the Sun. This August, Mars will reach its perihelion and be in line with Earth and the Sun at the same time.

The average opposition occurs about every two years, when Earth laps Mars on its orbit around the Sun. In 1995, the opposition brought Mars 101.1 million kilometers (62.8 million miles) from the Earth, twice as far as this most recent approach.

This composite image of Earth and Mars was created to allow viewers to gain a better understanding of the relative sizes of the two planets.

"It gets more complicated as the race tracks are changing shape and size and are rotating, changing their orientation," Standish explains. "So this place where the two tracks are closest together constantly changes, changing the opposition closeness as well. This is why a 'great' approach, like the one this month, hasn't happened in 50,000 years. But with the tracks closer together now, there will be even closer approaches in the rela-



***Memory Jogger...***  
**See you at the next SAGATUG meeting this Friday, August 8, 2003 from 7 to 10 p.m. at the Arcadia Park Senior Citizen's Center, 405 S. Santa Anita Ave. (See page four for directions and more upcoming events.)**

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Frosty white water ice clouds and swirling orange dust storms above a vivid rusty landscape reveal Mars as a dynamic planet in this sharpest view ever obtained by an Earth-based telescope

*(Continued from page 1)*

### ***Mars Closer***

tively near future."

Aside from visiting a local observatory, peering through a telescope is the best way to take advantage of this unique opportunity. Since June, Mars has been noticeably bright in the night's sky, only outshined by Venus and the Moon. Observers in the Northern Hemisphere will see it glowing remarkably in the southern sky lying in the constellation Aquarius, best seen just before dawn.

"You're not going to go outside and see some big red ball in the sky. It will look like a bright red star," said Standish.

The word 'planet' is derived from the Greek expression for 'wanderer.' At such a close distance, Mars remains true to this expectation as it con-

sistently wanders across the night's sky. Tracking the "red star's" movement from week to week is yet another way to appreciate this rare occasion, since Mars appears to dart across the sky in comparison to more distant planets, such as Jupiter.

Although Mars will be closest on August 27, astronomers suggest viewing the planet earlier, as dust storm season is just beginning on the red planet and can obstruct a more detailed view.

Whether you are viewing through a telescope, glancing through a pair of binoculars, or stargazing outside the city, be sure to take advantage of this once-in-a-lifetime opportunity, for Mars will not make another neighborly visit this close until 2287.

Contact: JPL/Lisa Townsend (818) 393-5464

July 28, 2003

# Mission to Far Off Pluto Approved

*Reprinted from NASA Website*

Long considered to be the smallest, coldest, and most distant planet from the Sun, Pluto may also be the largest of a group of objects that orbit in a disk-like zone of beyond the orbit of [Neptune](#) called the [Kuiper Belt](#). This distant region consists of thousands of miniature icy worlds with diameters of at least 1,000 km and is also believed to be the source of some [comets](#).

Discovered by American astronomer Clyde Tombaugh in 1930, Pluto takes 248 years to orbit the Sun. Pluto's most recent close approach to the Sun was in 1989. Between 1979 and 1999, Pluto's highly elliptical orbit brought it closer to the Sun than Neptune, providing rare opportunities to study this small, cold, distant world and its companion moon, [Charon](#).

Most of what we know about Pluto we have learned since the late 1970s from Earth-based observations, the Infrared Astronomical Satellite (IRAS), and the [Hubble Space Telescope](#). Many of the key questions about Pluto, Charon, and the outer fringes of our solar system await close-up observations by a robotic space flight mission.

Pluto and Charon orbit the Sun in a region where there may be a population of hundreds or thousands of similar bodies that were formed early in solar system history. These objects are referred to interchangeably as trans-Neptunian objects, Edgeworth-Kuiper Disk objects or ice dwarves.

Pluto is about two-thirds the diameter of [Earth's Moon](#) and may have a rocky core surrounded by a mantle of water ice. Due to its lower density, its mass is about one-sixth that of the Moon. Pluto appears to have a bright layer of frozen methane, nitrogen, and carbon monoxide on its surface. While it is close to the Sun, these ices thaw, rise, and temporarily form a thin atmosphere, with a pressure one one-millionth that of Earth's atmosphere. Pluto's low gravity (about 6 percent of Earth's) causes the atmosphere to be much more extended in altitude than our planet's. Because Pluto's orbit is so elliptical,

Pluto grows much colder during the part of each orbit when it is traveling away from the Sun. During this time, the bulk of the planet's atmosphere freezes.

In 1978, American astronomers James Christy and Robert Harrington discovered that Pluto has a satellite (moon), which they named Charon. Charon is almost half the size of Pluto and shares the same orbit. Pluto and Charon are thus essentially a double planet. Charon's surface is covered with dirty water ice and doesn't reflect as much light as Pluto's surface.

No spacecraft have visited Pluto. NASA is currently considering a mission called [New Horizons](#) that would explore both Pluto and the Kuiper Belt region. The earliest it would launch is 2006.

Because Pluto is so small and far away, it is difficult to observe from Earth. In the late 1980s, Pluto and Charon passed in front of each other repeatedly for several years. Observations of these rare events allowed astronomers to make crude maps of each body. From these maps it was learned that Pluto has polar caps, as well as large, dark spots nearer its equator.

## Related Links

[Missions to Pluto](#)

[Pluto Portal](#) (Southwest Research Institute)

[The Nine Planets: Pluto](#)

[StarDate: Pluto](#)

[Welcome to the PlanetsUniversity of Colorado's Pluto Page](#)

## Education and Activities

[Kid-Friendly Pluto & Kuiper Belt Page](#)

[Exploring the Planets - Pluto](#)

[The Struggle to Find the Ninth Planet, Essay by Clyde Tombaugh](#)

Is Pluto a Planet? The experts debate:

[International Astronomical Union](#)

[Smithsonian Astrophysical Observatory International Comet Quarterly](#)

**Next SAGATUG Meeting  
Time and Place:**

**7 to 10 p.m., Friday, August 8, 2003 at the  
Arcadia Park Senior Citizen's Center, 405 South  
Santa Anita Avenue, Arcadia.  
(In the park just south of Huntington Drive)  
Meetings are on the second Friday of every month**

**Club Officers and Board Members:**

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**Upcoming Events:**

**Manhattan Beach**, last Saturday, monthly, TRW Swap Meet, Admission Free.

**Santa Ana**, last Sunday of each odd month, ACP, 1310 E. Edinger, Admission Free.

**Pomona Swap Meet** 3<sup>rd</sup> Saturday, monthly, at Cal Poly Pomona, 3801 W. Temple Ave., Admission Free

**Pomona Fairplex**, , bldgs. 6 & 7 at LA Fair grounds, Gate 14, Admission \$7, plus parking.

**Burbank**, , 2003 (Sat. & Sun.), Hilton Burbank Airport & Convention Center, 2500 Hollywood Way, Burbank, CA 91505. 10 a.m. to 5 p.m. \$5 admission

**Costa Mesa**, Sept 12 & 13, bldg. 12, 2002, Orange County Fair and Exposition Center, 88 Fair Drive, Costa Mesa, CA 92626, 10:00 a.m. to 5:00 p.m., \$5 admission.

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**Deadline for the Newsletter**

The deadline for the INTERFACE is the last Saturday of the month.

**Republication:**

Articles may be republished if credit is given to the author and the San Gabriel Valley Technology User's Group.

**Please visit the new SAGATUG website at [www.sagatug.org](http://www.sagatug.org) There you will find photos of the meeting site, maps to the meeting, articles from other sources and an archive of the SAGATUG Interface.**

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