

Planetary Wonderings
June Focus: MESSENGER and Venus Fly-by
By Mary-Frances Bartels, NASA Solar System Ambassador

I am sure that plenty of readers have, over the past month or two, noticed the extremely bright “star” high up in the western sky as the sun sets. Of course, that “star” is not a star at all, but the planet Venus, shining at a magnitude of -4.3*. It hardly can get any brighter than this!

In the coming evenings, skywatchers can acquaint themselves with the MESSENGER spacecraft mission to Mercury. Late afternoon on June 5th, MESSENGER will fly within about 210 miles of the surface of the planet Venus, and get a gravity kick toward its ultimate destination, the sun-baked planet Mercury.

Both Venus and Mercury will be well-placed for viewing during dusk the week before MESSENGER's encounter with Venus. Go to a location away from bright lights with a good view of the western and northwestern horizon. To the right of Venus is the star Pollux and an equal distance farther to the right is Castor. These "twins" are the brightest stars in the constellation Gemini. The planet Mercury will be similar to Pollux in apparent brightness --- magnitude 0, located close to the horizon almost directly below Castor in the west-northwest. Another way to estimate the location of Mercury is to find the planet Saturn to the upper left of Venus. Mercury is a similar distance away from Venus but to the lower right. Find it quickly, before it sets. (These instructions are roughly correct for the evenings of June 1st through 5th.)

MESSENGER, much too small and faint to see, is approaching Venus from the right. By the evening of June 4th, MESSENGER will be closing in on Venus, just two-thirds of the Moon's diameter away. MESSENGER flies by Venus before sunset as seen from the United States on Tuesday, June 5th. But two hours later, its motion will be slightly changed so that it is accurately on course for its first flyby of Mercury next January 14th.

This is a good time to try to see MESSENGER's elusive target, Mercury, which is always a challenge to spot since it stays so close to the Sun. Look for it on the first clear evening because it fades rapidly during the first two weeks of June, moving ever closer to the Sun. A telescope will show Mercury's phase changing from half-phase to crescent.

MESSENGER will be making scientific measurements of Venus, as well as testing out its instruments for Mercury, as it zooms by Earth's sister.

Resource of the Month: Baby it's hot outside! We all know that it is a lot hotter on Mercury though. Spacecraft, even those far from the sun, are exposed to the blazing heat of the sun. Explore ways people and things can keep cool using one of the MESSENGER Education Modules at http://btc.montana.edu/messenger/teachers/MEMS_scipro.php#cool . Demonstrations include keeping items in a lunchbox cool as well as keeping a pat of butter from melting when placed in boiling water!

Activity of the Month: Learn how to measure angles in the sky. Often the distance between two objects in the sky as seen by the observer is measured in degrees (technically “arc degrees”). Your hand, held at arm's length, can be used as a rough “ruler” to measure some of these distances. One of the many web sites that describes measuring angles in the sky with the hand may be found at <http://www.geocities.com/angolano/Astronomy/PIinSky.html> . Here is a “cheat sheet” one can use:

- Width of the pinkie finger = 1°
- Width of the thumb = 2°
- Distance of thumb to first joint = 3°
- Distance across middle three fingers = 4° - 5°

- Distance across the fingertips -from index to "pinkie" OR the width of a fist = 10°
- Fingers widely spread (thumb tucked in) = 15°
- Distance between the thumb and little finger when the fingers are spread out = 20° (stretch a little more to get to 22°)

Remember, these measurements are only approximate. Double check your “hand accuracy” by measuring how many “fists” it takes to move from the horizon to the zenith. Since the angular distance from the horizon to the zenith is 90° , it should take nine “fists” to measure this span. Another neat way to calibrate your hand distance is by using a “crossbow” as seen at <http://brahms.phy.vanderbilt.edu/a103/info/angdist.shtml>. (The use of a “crossbow” to measure angles was totally new to me; I only discovered this method while researching for this column. I learn something new each time I sit down to write *Planetary Wonderings!*)

Suggestions, questions, and comments about “Planetary Wonderings” are welcomed and may be directed to stargazer @ keeplookingup.net (remove spaces). Past columns may be found at www.keeplookingup.net (click on “Planetary Wonderings” on the right side of opening screen).

Remember to *keep looking up!*

Sources: SSA - MESSENGER Venus Flyby e-mail from JPL to Solar System Ambassadors, May 30, 2007

<http://messenger.jhuapl.edu/> Official MESSENGER website

<http://www.historyoftheuniverse.com/magnitude.html> Information on magnitude

* Remember that with magnitudes, the smaller the number the brighter the object. For example, the Sun's magnitude is -26.7, the full Moon is about -12, Venus at its brightest is -4.7, and the bright star Sirius is -1.5. The faintest objects visible to the naked eye are about magnitude 5, and those through the largest telescopes are of approximate magnitude 20.