NASA Extends Current Missions

On April 3, NASA announced that it will extend operations on nine of its spacecraft missions. NASA decided to continue current missions in lieu of funding for new missions due to the budget-consuming James Webb telescope mission, slated for launch in 2018, and congressional budget slashing. The powerful Webb telescope will be the successor to the aging Hubble Telescope and will hopefully unveil glimpses of stars and galaxies formed shortly after the big bang. The Hubble telescope, by the way, is one of the missions on the list that will gain an extended life.

The Kepler spacecraft will have its life extended for up to four years. The Kepler has proven to be as revolutionary as the Voyager satellites of the 1980s. Voyager One and Two gave us the first close up views and increased our knowledge of the outer planets of our solar system.

Currently Kepler is increasing our understanding of planetary systems formed around distant stars and has prompted the creation of new planetary categories such as Super Jupiters, Neptune-class planets and Tatooine worlds. With the Kepler, the population of known planets has grown exponentially. Kepler has so far revealed 400 new planets and 2300 candidates for new planets.

The Chandra X-Ray Observatory will also gain two to four years of new life.

Launched in 1999, Chandra can detect x-rays 100 times more remote than any other satellite due to high resolution lenses and its orbit high above the x-ray blocking atmosphere of the Earth.

Chandra has allowed astronomers to study supernova remnants, black holes, gamma ray bursts and new star formation with a higher resolution and a deeper understanding.

Some of the other spacecraft that will also enjoy extended missions are the Fermi Gamma-ray space telescope, the Planck satellite, the Swift Gamma-ray Burst mission and the Spitzer space telescope mission. The Spitzer specializes in capturing images of very young stars and capturing light from planets around distant stars that are larger than Jupiter.

Eclipse and Transit

Two solar events will take place this spring. On May 20, a partial solar eclipse will be visible in southern California. Other locations on the planet will be able to see a total annular eclipse of the Sun, but we unfortunately will only get to glimpse a part of the eclipse sequence. The eclipse will be visible around 6:30 p.m. (see next page).

A rare event, a transit of Venus, will occur on the afternoon of June 5 (see next page). A transit occurs when a planet crosses the face of the Sun from our point of view. In our solar system, only transits of Mercury and Venus are visible from the Earth. Venus is roughly the size of the Earth, so viewing the transit gives us a humbling view of what the Earth would look like compared to the Sun. The next transit will take place in 2117 so make sure you don’t miss this.

Proper safety precautions must be followed when viewing the Sun during the eclipse and the transit or severe eye damage could result. Do not look directly at the Sun. Follow the safety precautions described on the following page.
How Do I Safely Observe the Sun?

Things Not to Do When Observing the Sun

Do not directly look at the Sun with your naked eyes.

Sunglasses will not protect your eyes from the Sun while observing an eclipse or transit.

Do not point your camera or videocam at the Sun. Many cameras use sensitive CCD chips that can be damaged or burnt out by the Sun.

Looking through an unfiltered telescope or binoculars presents a high risk of eye damage. Do not look at the Sun using a telescope or binoculars unless they are designed with special solar optics. Beware of cheap plastic filters you can place on telescope that claim they are safe. They may melt on your telescope. Solar filters on the whole are expensive; if you come across an inexpensive solar filter or telescope, be skeptical and do further research before purchasing.

Looking at the Sun through photographic color negatives is not recommended.

How to Safely View the Sun

- **Use specifically designed solar telescopes, binoculars and solar filters.** These devices are generally expensive, but well worth it if you plan to make solar viewing your area of interest.

- **Use #14 Welders glass.**

- **Mylar eclipse glass.** A variety of these glasses or viewers are available on-line.

- **Make a simple pin-hole viewer.** Poke a small hole in sheet of paper and hold it above another sheet of paper a few feet away. The Sun’s image will be projected onto the next sheet.

  - **Look at the shadows under trees.** Quite often leaves filter the Sun’s image and function as a pinhole projector. Quite often you can see multiple images of an eclipse filtering through the leaves.

A number of solar projectors are also available on the market. They work on principles similar to a pinhole projector and are affordable. None of these devices require you to look directly at the Sun.

It bears repeating, do not look at the Sun with an unaided eye. Severe damage or in extreme cases, even blindness may result. Please do not take these warnings lightly. Spend some time researching any device that you use to view the Sun.

What is an annular eclipse?

An annular eclipse occurs when the entire disk of the Moon is visible in front of the Sun, but some of the Sun’s disk is still visible. See the image on the first page of this newsletter. It differs from a total solar eclipse during which the Moon’s disk entirely blocks the disk of the Sun at the moment of totality.

What is a diamond ring?

A diamond ring is an event that often suddenly occurs immediately following the totality of an eclipse. One region along the edge of the Sun dramatically flares up, creating an impression of a wedding ring flashing in a bright light. Diamond rings are a favorite subject of eclipse photographers.