Vocabulary Section

** The terms are organized alphabetically and by main topic*

A. The Sun

1. Coronal Mass Ejection (CME)- a huge release of plasma from the Sun's corona. It can disrupt the flow of the solar wind. One of the S/WAVES Mission's goals is to track and measure the extent and structure of CME's.

2. Prominence- an eruption of plasma that extends out in the corona and appears to be darker than the rest of the Sun. This is because in comparison with the corona's extremely hot plasma, prominences contain much cooler plasma. The temperature of the Sun's corona is approximately 2 million degree C and prominences are approximately 5000°C.

3. Solar Flares- a release of magnetic energy from the Sun's corona. Even though they are smaller than CME's, solar flares can also accelerate and eject particles into space. They are energetic explosions that can reach temperatures from 10 or 20 million degrees Kelvin. Solar flares are also associated with sunspots. One of the S/WAVES' objectives is to track and probe solar flare electrons.

4. Solar wind- a constant discharge of particles (protons and electrons) released in all directions from the upper atmosphere of the Sun. Solar wind moves at an average speed of approximately 400km/s (in the ecliptic plane) and it takes about 4 days to travel from the Sun to the Earth.

5. Type II radio burst- radio emissions produced by a fraction of the CME in the interplanetary medium (IPM). Energized electrons from CME- driven shocks produce these radio emissions. The further away these emissions are from the Sun, the lower their frequency. The S/WAVES instrument measures radio sources to track the propagation of the shocks and CMEs.

6. Type III radio burst- intense radio emissions produced by the acceleration of electrons during solar flare events. S/WAVES tracks these bursts from high frequencies close to the Sun (15MHz) to 1AU from the Sun (~30 KHz).

B. Astronomy

7. Angstroms- a very small unit of length equal to one hundred-millionth (10) of a centimeter. Its abbreviation or symbol is Å. For example, the distance between atoms is said to be from 3 to 5 angstroms.

8. Astronomical units (AU)- a standard unit used to measure distances within the solar system. It is the mean distance between the Earth and the Sun. One AU is 149,597,870 kilometers, slightly less than thedistance of 150 million kilometers (93 million miles) identified as the value of 1AU.

C. General Science

9. Electromagnetic spectrum- The spectrum of waves from radio waves to gamma rays. These waves have a dual component; they contain electric and magnetic field oscillations. Because of this duality, electromagnetic waves can travel without a medium and they may behave as waves or as particles (photons). Waves in the electromagnetic spectrum are organized by their relative wavelength and frequency. The electromagnetic wave with the lowest frequency is the radio wave, followed by infrared, white light (combination of the colors red, orange, yellow, green, blue, indigo and violet- each with their own frequency range), ultraviolet, x-rays and finally, gamma rays. Notice that from all the waves that form the electromagnetic spectrum, the only one that our eyes can detect is white light, also called visible or optic light

10. Electrons- negative particles that surround the nucleus of an atom. These particles are located in different energy levels. The further away the electrons are from the nucleus, the higher the energy level. Sometimes, when energy is added to certain atoms, its electrons may become exited and jump to higher energy levels. This happens in the Earth's magnetosphere forming the spectacular show of the "northern lights" or aurora borealis.

11. Frequency- is the number of waves' oscillations that pass a fixed point per unit time. Its basic unit is Hertz (Hz)- one Hz is one cycle per second. Radio waves measured by the S/WAVES instrument range from 10 KHz to 16 MHz.

12. In-situ measurements- for the S/WAVES instrument, in-situ measurement refers to the waves data being collected around the STEREO spacecraft. Such signals can come from electrons or waves moving close to the antennas.

13. Nuclear Fusion- process in which multiple atoms combine together releasing a tremendous amount of energy. The Sun's energy comes form this process. Isotopes of hydrogen collide with each other forming helium and releasing atomic particles and energy.

14. Plasma- state of matter composed of ionized gas. It occurs when the electrons and ions of a gas separate due to high temperatures or other reasons.

15. Radio wave- is an electromagnetic wave with the longest wavelength and relatively smallest frequency of the electromagnetic spectrum. Stars, planets and

many other objects in space emit light at very large wavelengths. These long waves are in the radio region of the electromagnetic spectrum.

16. Triangulation- is a process or technique in which the source of a radio wave can be determined by measuring the direction of the signal from two or three different points. S/WAVES uses triangulation to determine the source location of CME shocks.

17. Wavelength- is the distance between two consecutive maximum points in a wave. The symbol for wavelength is λ and its units may vary depending on how great that distance is (mm, cm, m, km, etc.).