

Website: <http://www.ss.ncu.edu.tw/~yhyang/110-2/he.html>

Evaluation:

Project Report: 40% (including 20% progress reports and 20% final report on 6/17)

Final Exam: 30% (6/10)

Performance: 30% (including 20% HWs & discussions and 10% weekly report)

Textbooks:

- Heliophysics : space storms and radiation : causes and effects, Carolus J. Schrijver, George L. Siscoe, Cambridge University Press, 2010.
- Heliophysics : plasma physics of the local cosmos, Carolus J. Schrijver, George L. Siscoe, Cambridge University Press, 2009.
- Heliophysics : evolving solar activity and the climates of space and earth, Carolus J. Schrijver, George L. Siscoe, Cambridge University Press, 2010.

Textbooks (cont.):

- Solar Energetic Particles: A Modern Primer on Understanding Sources, Acceleration and Propagation, Donald V. Reames, Springer, 2017.
- Energetic Particles in the Heliosphere, George M. Simnett, Springer, 2017.
- Solar Cosmic Rays: Fundamentals and Applications, Leonty Miroshnichenko, Springer, 2015.
- Physics of Space Plasmas: An Introduction, G. K. Parks, Westview Press, 2004.
- Introduction to Space Physics, M. G. Kivelson and C. T. Russell, Cambridge University Press, 1995.

SAO/NASA ADS:

<https://ui.adsabs.harvard.edu/classic-form>

Solar:

→**Solar Monitor:** <http://solarmonitor.org/>

→**Helioviewer:** <https://helioviewer.org/>

→**iSolSearch:** <https://www.lmsal.com/isolsearch>

→**HEK Data Search:** <https://www.lmsal.com/heksearch/>

Interplanetary Space:

→**Real Time Solar Wind:**

<https://www.swpc.noaa.gov/products/real-time-solar-wind>

NASA Space Weather Prediction Center:

<https://www.swpc.noaa.gov/>

NASA Space Weather Action Center:

<http://sunearthday.nasa.gov/swac/data.php>

News:

→**spaceweather.com:** <http://spaceweather.com/>

Heliosphere

EDGING INTO THE UNKNOWN

After 35 years, the Voyager 1 spacecraft may finally be nearing the edge of the Solar System — the heliopause — but the probe's readings are proving difficult to interpret. Its sister craft, Voyager 2, is probably a few years away from reaching the milestone.

VOYAGER 1

Launched 5 September 1977.
Current distance from Sun:
18.2 billion kilometres.

BOW SHOCK?

A shock wave of ionized gas. Latest observations suggest the Solar System is not moving through the interstellar medium fast enough to create one.

VOYAGER 2

Launched 20 August 1977.
Current distance from Sun:
14.9 billion kilometres.

HELIOPAUSE

The boundary of the Solar System, where the outward pressure of the heliosphere is in balance with the inward push of the interstellar medium.

HELIOSPHERE

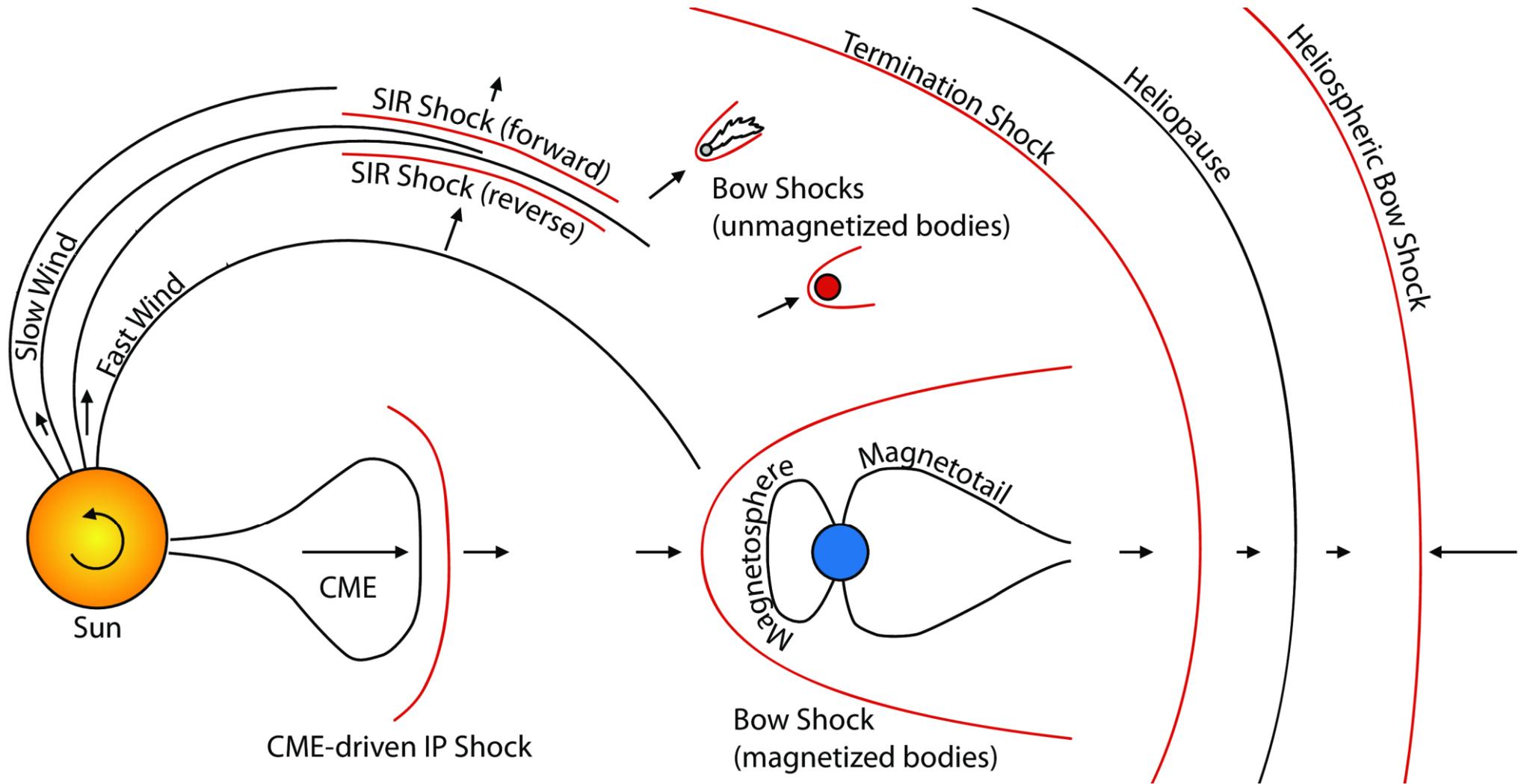
The extended bubble of solar particles streaming into the interstellar medium. It is nearest to the Sun in the direction of the Solar System's motion through space.

TERMINATION SHOCK

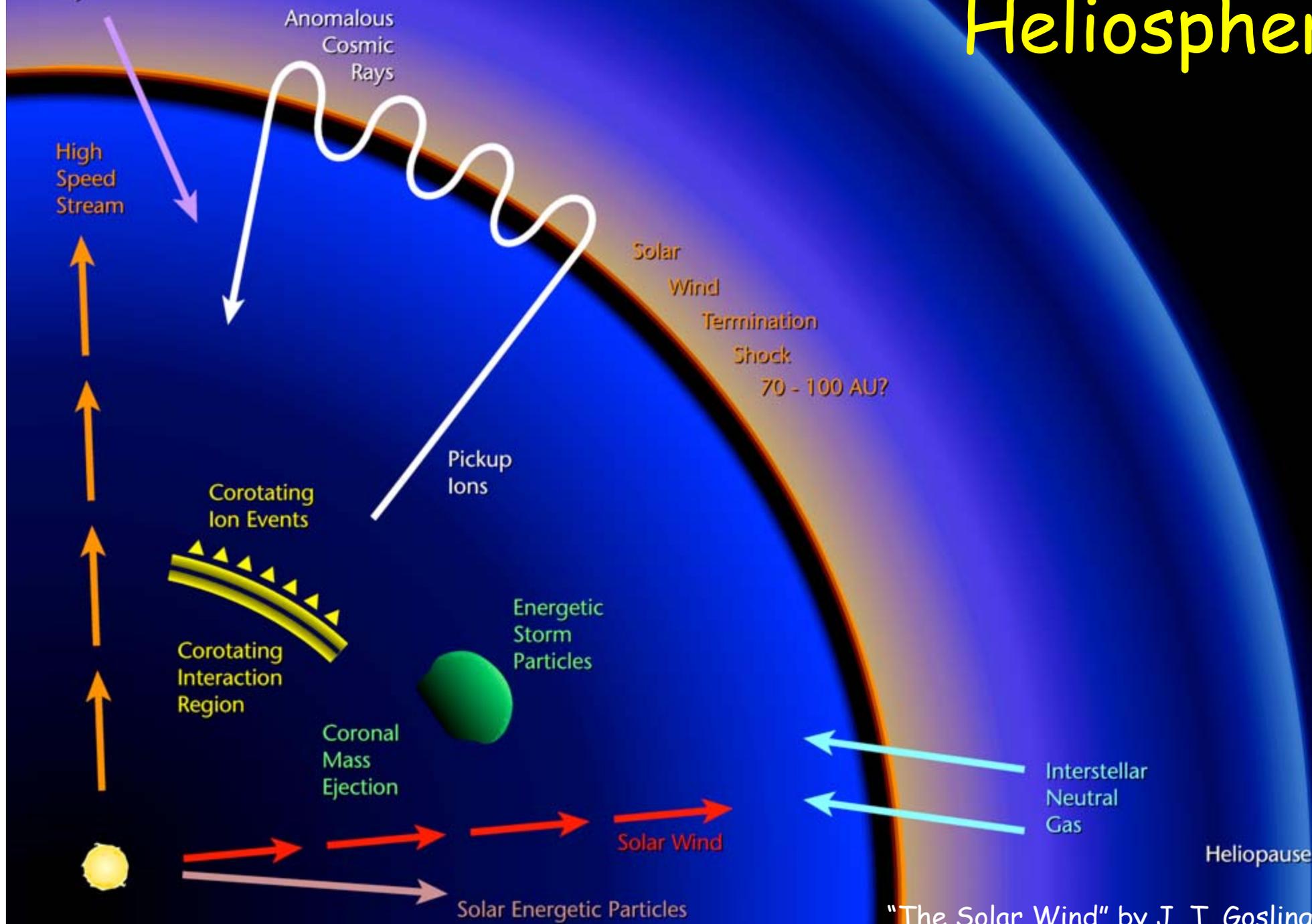
Past this boundary, particles streaming from the Sun slow to subsonic speed. Voyager 1 crossed it in December 2004; Voyager 2 in August 2007.

INTERSTELLAR
SPACE

Heliospheric Shocks



Energetic Particles in the Heliosphere



"The Solar Wind" by J. T. Gosling, 2009

Dynamic solar effects on Earth → solar storms

