

# Space News Update – September 2013

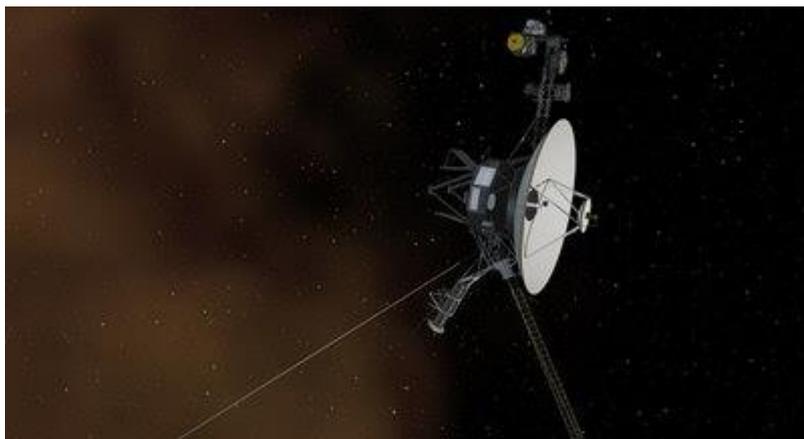
*By Pat Williams*

- Voyager Journeys into Interstellar Space
- The Interplay of Interstellar Dust and Hydrogen
- Why does our Sun have such a strangely low Lithium Content?
- Why do Black Holes consume less material than expected?
- Probing the mystery of Dark Energy.
- An Out-of-this-World Laboratory used to study the effects of Living in Space on the Human Body.
- Plasmasphere Interacting with Van Allen Belts.

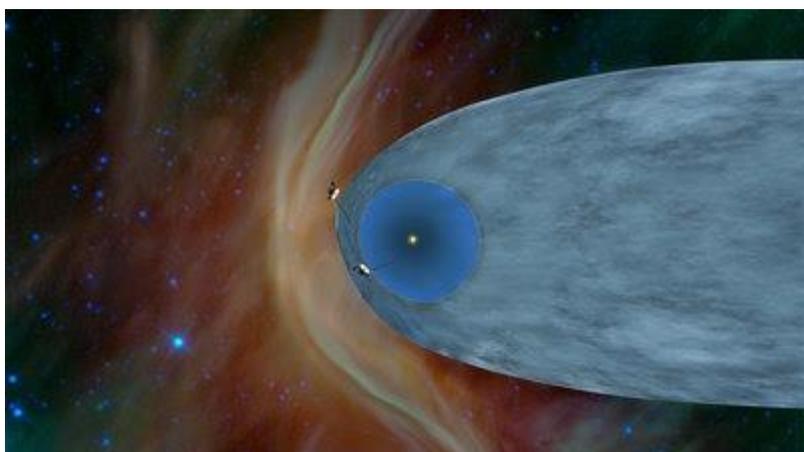
## INTERSTELLAR SPACE

(12 September 2013)

NASA's **Voyager 1 Spacecraft** is now 19 billion kilometres from the Sun and outside the solar bubble in interstellar space. This space, between the stars, is populated with ionised gas or plasma. Although the coronal mass ejection of March 2012 took only 13 months to reach Voyager the spacecraft took 35 years from September 1977 until 25 August 2012 to reach interstellar space.



*This artist's concept shows the Voyager 1 spacecraft entering the space between stars. Interstellar space is dominated by plasma, ionized gas (illustrated here as brownish haze), that was thrown off by giant stars millions of years ago. (courtesy: NASA/JPL-Caltech)*



*The general locations of Voyager 1 and 2 are shown in this illustration at the edge of the heliosphere, the bubble created by solar wind. (courtesy: NASA/JPL-Caltech)*

[www.nasa.gov/.../nasa-spacecraft-embarks-on-historic-journey-into-inter...](http://www.nasa.gov/.../nasa-spacecraft-embarks-on-historic-journey-into-inter...)

(This link is not available at present due to US Government shutdown.)

## **INTERSTELLAR DUST**

**(25 September 2013)**

For astrophysicists, the interplay of hydrogen, the most common molecule in the universe, and the vast clouds of dust that fill the voids of interstellar space has been an intractable puzzle of stellar evolution.

<http://www.news.wisc.edu/22159>

## **THE SUN**

**(28<sup>th</sup> August 2013)**

An international team led by astronomers in Brazil has used ESO's (European Southern Observatory's) Very Large Telescope to identify and study the oldest solar twin known to date. Located 250 light-years from Earth, the star HIP 102152 is more like the Sun than any other solar twin — except that it is nearly four billion years older. Follow the link to learn why our Sun has such a strangely low lithium content.

<http://www.eso.org/public/unitedkingdom/news/eso1337/>

## **BLACK HOLES**

**(29<sup>th</sup> August 2013)**

Why do massive black holes consume less material than expected?

<http://www.umass.edu/newsoffice/article/wang-international-team-discover-why-super>

## **DARK ENERGY**

**(3<sup>rd</sup> September 2013)**

Dark Energy Survey begins five-year mission to map southern sky in tremendous detail.

[http://www.fnal.gov/pub/presspass/press\\_releases/2013/DES-20130903.html](http://www.fnal.gov/pub/presspass/press_releases/2013/DES-20130903.html)

## **THE COLUMBUS LABORATORY AT THE INTERNATIONAL SPACE STATION**

**(6<sup>th</sup> September 2013)**

ESA has selected the new Swedish Aerospace Physiology Centre of the Royal Institute of Technology in Stockholm to support the Agency's human research efforts with astronauts on the International Space Station.

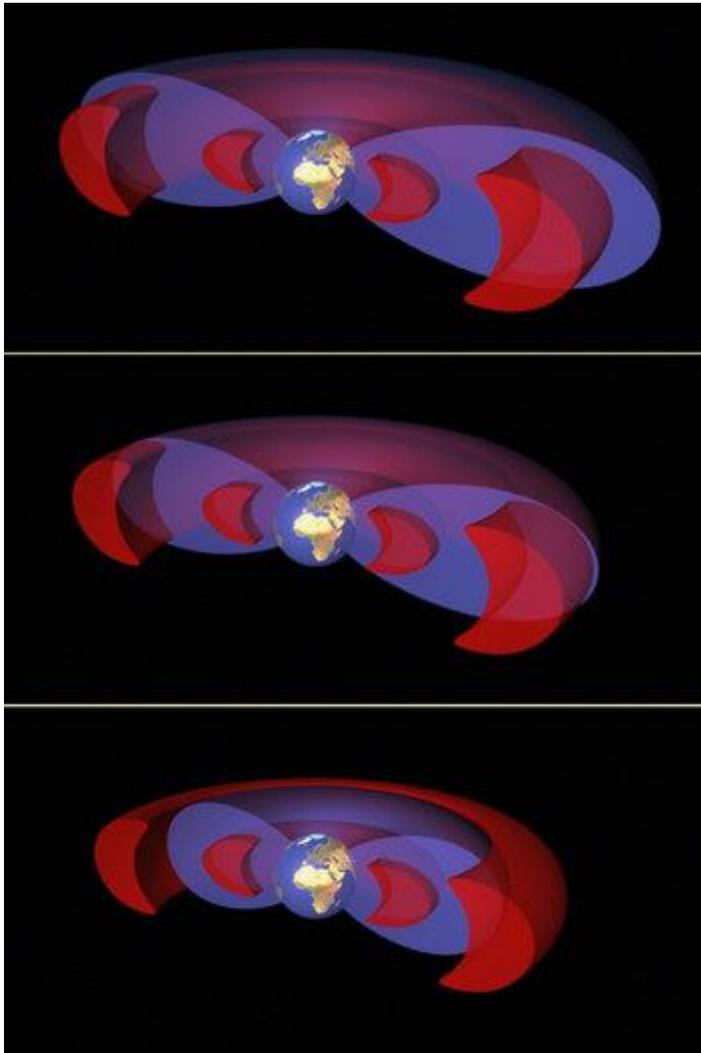
[http://www.esa.int/Our\\_Activities/Human\\_Spaceflight/Research/ESA\\_teams\\_up\\_with\\_Swedish\\_space\\_physiology\\_centre](http://www.esa.int/Our_Activities/Human_Spaceflight/Research/ESA_teams_up_with_Swedish_space_physiology_centre)

[http://www.esa.int/Our\\_Activities/Human\\_Spaceflight/Columbus/Columbus\\_laboratory](http://www.esa.int/Our_Activities/Human_Spaceflight/Columbus/Columbus_laboratory)

## THE VAN ALLEN BELTS

*(10<sup>th</sup> September 2013)*

ESA's Cluster mission shows that the Plasmasphere is interacting with the Van Allen belts. "The presence of the radiation belts is a key factor in the design of all spacecraft in low Earth orbit, as well as a natural hazard for astronauts," comments Philippe Escoubet, ESA Project Scientist for Cluster. "Forecasting the dynamics of the belts is one of our prime objectives, but this is only achievable by understanding the underlying physics."



*How geomagnetic conditions change the relative locations of the outer boundary of the Earth's plasmasphere (the plasmapause) and the Van Allen belts. (courtesy: ESA - C. Carreau)*

<http://sci.esa.int/cluster/52802-cluster-shows-plasmasphere-interacting-with-van-allen-belts/>