

## Hubble goes to the eXtreme!

Like photographers assembling a portfolio of best shots, astronomers have assembled a new, improved portrait of mankind's deepest-ever view of the universe. Called the eXtreme Deep Field, or XDF, the photo was assembled by combining 10 years of NASA Hubble Space Telescope photographs taken of a patch of sky at the center of the original Hubble Ultra Deep Field. The XDF is a small fraction of the angular diameter of the full moon.

The Hubble Ultra Deep Field is an image of a small area of space in the constellation Fornax. By collecting faint light over many hours of observation, it revealed thousands of galaxies, both nearby and very distant, making it the deepest image of the universe ever taken at that time.

The new full-color XDF image is even more sensitive, and contains about 5,500 galaxies even within its smaller field of view. The faintest galaxies are one ten-billionth the brightness of what the human eye can see.

Read more about Hubble's deepest look into space and watch a short video about it [here](#).



## NuSTAR spots black hole flare

NASA's newest set of X-ray eyes in the sky, the Nuclear Spectroscopic Telescope Array (NuSTAR), has caught its first look at the giant black hole parked at the center of our galaxy. The observations show the typically mild-mannered black hole during the middle of a flare-up.

"We got lucky to have captured an outburst from the black hole during our observing campaign," said Fiona Harrison, the mission's principal investigator at the California Institute of Technology (Caltech) in Pasadena. "These data will help us better understand the gentle giant at the heart of our galaxy and why it sometimes flares up for a few hours and then returns to slumber."

The new images can be seen by visiting [here](#) and be sure to stop by [NuSTAR's site](#) to read more about this discovery!



Over 300 people visited during our annual Astronomy Day on October 27<sup>th</sup>. Were you one of them? Share your experiences and photos on Facebook!



### Closest planet discovered

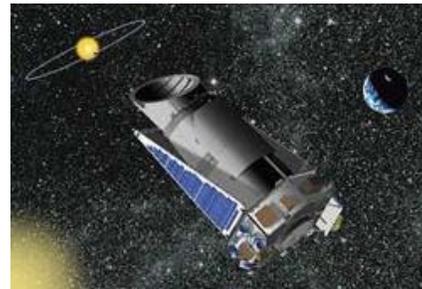
The star system closest to our own sun hosts a planet with roughly Earth's mass and may harbor other alien worlds as well, a new study reports.

Astronomers [detected the alien planet](#) around the sun-like star Alpha Centauri B, which is part of a three-star system just 4.3 light-years away from us. The newfound world is about as massive as Earth, but it's no Earth twin; its heat-blasted surface may be covered with molten rock, researchers said.

The mere existence of the planet, known as Alpha Centauri Bb, suggests that undiscovered worlds may lurk farther away from its star — perhaps in the [habitable zone](#), that just-right range of distances where liquid water can exist.

Alpha Centauri Bb zips around its star every 3.2 days, orbiting at a distance of just 3.6 million miles (6 million kilometers). For comparison, Earth orbits about 93 million miles, or 150 million km, from the sun.

It's possible that Alpha Centauri A and Proxima



### Kepler mission jeopardized

NASA's Kepler space telescope, a sleuth with electronic eyes, needs an extra four years to meet its goal of finding an Earth-sized planet in habitable zones around other stars, but a critical hardware failure aboard the probe this summer has managers worried the mission could end at any time.

Kepler monitors approximately 156,000 stars for dips in brightness, an indication a planet could be passing in front of it.

Kepler has confirmed 77 new planets beyond the solar system. Including data to be released by the end of October, there are nearly 3,000 candidates for exoplanets waiting to be verified by follow-up observations.

But two issues with Kepler have the attention of scientists and engineers.

On July 14, one of the spacecraft's four reaction wheels stopped due to increasing friction. The spinning masses control Kepler's orientation in space and keep the telescope locked on to target stars.

Centauri may host planets as well. The system will likely be the subject of newly intense scientific scrutiny, as astronomers seek to confirm the existence of Alpha Centauri Bb, learn more about it (such as whether or not it has an atmosphere) and hunt for additional nearby alien worlds.

Learn more about how this discovery was made, watch a video and take a survey [here!](#)

Although Kepler's 95-megapixel digital camera is plenty sensitive, bands of noise appear in raw imagery streaming down from the telescope. Scientists have devised complex computer algorithms to remove the meaningless data, but the noise problem adds to the time and cost of analyzing Kepler data.