Tip: first read the article about the Big Bang.

The accelerated expansion of the universe can be explained by what is outlined below:

The Friedman equation describes the expansion of the universe on the basis of densities. These densities can be: vacuum energy density and matter density (dark and visible matter).
Now suppose the universe began with a certain amount of vacuum energy compressed into a sphere (see the article about the big bang) in a really empty space. The sphere has no rotation (that has been measured experimentally on the rotation of galaxies) and that makes the calculation simple, using the Friedman equation.
The sphere expands radially because vacuum energy has a pressure to the outside (expansion), in contrast to matter that gives a pressure to the inside (contraction). But that matter is not yet present at the time of the big bang! The initial expansion speed of that vacuum energy sphere can be calculated and comes out at $\sqrt{3} * c$. This is therefore larger than the speed of light.

Note: that calculated speed is at the outside of the sphere (R_0)! Inside that sphere the expansion rate at radius r can be calculated using the Hubble equation (the Hubble constant is time dependant!).

As soon as the expansion speed falls below the value of c, matter can be formed from vacuum energy anywhere in the universe at those places (sphere shells) where the expansion speed has fallen below c (initially from the centre of the sphere to the inner shell of the sphere, where the expansion rate is below c (calculated at $0{,}58R_0$, where R_0 is the radius of the big bang sphere).
(Within the vacuum energy sphere, the energy density at a particular time depends on the radius: $\rho = \rho_0/r^3$).
After the start of the big bang, matter will start to be formed immediately in the volume of the sphere between r=0 and $r=0{,}58R_0$. As at this time the vacuum energy density is at its highest, high energy particles will be formed. Present day, the vacuum energy is at its lowest value and only dark matter will be formed by mainly hydrogen atoms in the outer parts of a galaxy where hydrogen clouds are still present. The strong force present in the proton of the hydrogen atom is responsible for the conversion of vacuum energy to dark matter. This process is still ongoing and explains the accelerated expansion that is being observed in a very simple way!
As long as only vacuum energy radially expands, the expansion speed becomes slower and slower. However, when it falls below c, matter can be formed.
The expansion speed is now even slower in the inner sphere (where $v<c$) for 2 reasons:
1) Vacuum energy disappears and returns in the form of matter.
2) Matter brings pressure within (gravitation, contraction) .

Once enough matter has been formed to give a noticeable counterforce to the vacuum energy expansion, one sees a delay of the vacuum energy expansion, viewed from the centre of the sphere concerning the inner sphere where the expansion speed is below c! This happened about 6 billion years ago.
That means that the outer shell that still moves with an expansion speed larger then c, moves quicker away from the innershell. Only when the overall expansion speed at the outer radius (R) reaches a value below c, that process will stop.
Now matter will be formed in the total volume of the spherical universe.
So there is indeed a preferred direction in the universe, namely the centre of the big bang. This would then be the opposite direction of the residual speed that remains after correction of all velocities to which the earth is subject to, when measuring the 3K-background radiation. That

speed (about 600 km/sec) would then be the current expansion speed of the earth (read: local group of galaxies) compared to the centre of the big bang.
The current view is that space is expanding, but it is actually the vacuum energy that expands and takes up the matter formed therein. This immediately solves the problem of what's on the edge of the universe: just empty space, real vacuum!
Note: When the expansion rate above c, decreases to below c (crossing the line) there might be an spherical flash of waves travelling at the speed of light: photons!
These photons initially interact with matter and their wavelength decreases in time with the expansion of the universe and has formed the 3K background radiation.
Presently the percentage wise distribution of the different kind of densities, measured from the cosmic 3K radiation, is as follows:
Vacuum energy distribution: 68 %
Dark matter distribution: 27%
Visible matter distribution: 5%
That means that the universe is still in the expansion phase as the vacuum energy distribution is still above 50%. Due to the low temperature of the background radiation (3^0 Kelvin) only dark matter will be formed. The visible matter percentage of 5% will most likely not be increased as in the present stage there is no expansion rate anymore close to c at the edge of the vacuum energy sphere. Presently there is then only conversion of vacuum energy to dark matter.

Looking at it from the centre of the sphere, this model means that the conversion of vacuum energy to matter still continues, until all vacuum energy has been converted to matter. By that time there is no longer talk of expansion but contraction. As soon as that contraction reaches the speed of light (universe becomes locked up), all matter is converted into vacuum energy and a new big bang takes place.
The only question that remains is: where does all that matter / vacuum energy comes from?

Three physicists have won the 2011 Nobel Prize in physics for their proof that the universe is expanding rapidly. The physicists made this remarkable find by determining the distance of supernovas.

Saul Perlmutter of the Lawrence Berkeley National Laboratory will receive the Nobel Prize in Physics in December with his colleagues Brian Schmidt and Adam Riess . Perlmutter started his Supernova Cosmology Project in 1988 to measure the supposed delayed expansion of the universe. With a competitive project, High z Supernova Search Team, Brian Schmidt and Adam Riess were on track since 1994. The groups were involved in a race.

The idea was that due to the large amount of matter in the universe the expansion will slow down. The bewilderment was great, according to Schmidt by telephone at the presentation, when he and Riess got crazy results in the late 1990s. "Crazy to be true." Nevertheless, they could not find any errors in their observations. The weird results turned out to be correct and eventually they published the result.

The discovery that the universe is expanding rapidly confirms Einstein's idea that the universe contains a lot of energy as well as matter. That energy now ensures accelerated expansion.

Light beacons.

For their measurements, the physicists looked at supernovas of the type Ia in their projects. They arise when a white dwarf explodes. Some smaller stars turn into such a white dwarf at the end of life. Sometimes the gravitational field of such a white dwarf can suck in matter from a neighbouring star. If the mass of the white dwarf is 1.4 times the mass of the sun, all kinds of fusion reactions inside the star run wild. What follows is a powerful explosion, a supernova, with a specific brightness. These are a kind of beacons, where the brightness of the supernova is a measure of the distance.

Now such supernovae are very rare. In a galaxy like the Milky Way, a white dwarf explodes only once or twice a millennium. In the supernova projects, astronomers made use of modern techniques, including photosensitive chips that monitored thousands of galaxies. That way they could see a few dozen of those supernovae. They discovered that further back in time, at a distance of six billion light years, the supernovae were much weaker than expected. Apparently their distance to the earth was greater and that is proof of a faster expansion of the universe.

Physicists are usually conservative, one of the Swedish members of the Nobel Committee emphasizes at the announcement, but nevertheless the observations and conclusions of the new Nobel Prize winners were quickly accepted after their publication from 1998 onwards. Other measurements confirmed the conclusions. "This research forms a milestone in physics, and provides a new understanding of the universe."