

# 3.0

## A BIG HISTORY OF EVERYTHING

**00:00–1:09** Big History has begun to reveal the eight biggest turning points in the story of our Universe, eight threshold moments that will mysteriously lead to us. JUST RIGHT The first...the Big Bang...exploding in just the right way to create forces like gravity, but it's still too hot to form atoms. All that is about to change. We are about to reveal the second threshold moment.

**1:09–1:59** Only at the point of about 380,000 years have things cooled enough that we can finally get matter as we recognize it. THE UNIVERSE COOLS Without a cooling Universe, there's no way that we or anything else that has real structure would exist.

The first atoms to appear are hydrogen and helium, the two most basic elements. But their formation is not the second threshold. Hydrogen and helium are just the building blocks of the portal yet to come. Since all matter exerts a gravitational pull, giant clouds of these atoms begin to clump together into forms we recognize today.

Gravity is the sculptor of the Universe, and small variations in the density of the Universe at early times led to the formation of these gigantic structures, galaxies, and clusters of galaxies and super clusters of galaxies, separated by enormous voids. This is mega engineering on the largest scales.

Now, within these mega-structures...trillions of smaller clouds of hydrogen and helium begin to condense and spin.

So gravity is working on these clouds, crushing, condensing, compressing. Inside them, temperatures are increasing, pressure is heating up. And eventually, once a certain temperature is reached inside these vast clouds — roughly 10 million degrees Celsius — nuclear fusion will take place.

Once these conditions are met and the critical amount of atoms, temperature, and pressure come together, we reach another turning point, Big History's second great threshold...Stars light up.

**1:59–2:55**

VARIATIONS  
IN DENSITY

**2:55–3:41**

STARS LIGHT UP

There was no light immediately before this because there was nothing in the Universe to create light, and we hit a very significant threshold in the history of the Universe — let there be light.

**3:41–4:42** From this point onward, the Universe crosses through a portal from which there will be no turn-ing back. Before stars, all the energy in the Universe emanated from one source the Big Bang. Now, there are sites scattered throughout the Universe, hot spots of energy, warmth, density. The first generation of stars light up the Universe, but their fuel begins to run low. They start to burn out. It is with the death of this first generation of stars that we cross another portal in our epic story.

THE THIRD  
THRESHOLD