Twitter Thread by Katie Mack



Katie Mack
@AstroKatie

Light travels at about 1 foot per nanosecond.

Hold your hand up 12 inches from your face: you're seeing your hand as it was a nanosecond ago. Everything you look at is, to one degree or another, in the past. The farther away in space, the more ancient in time.

You can't see the Sun as it is now, but you can see it as it was about 8 minutes ago. You can't see Alpha Centauri now, but you can see it 4.4 years ago. You can see the Andromeda Galaxy as it was 2.5 million years in the past. And so on.

With powerful telescopes, we can see galaxies whose light has been traveling to us for more than 13 billion years. We see them shining in a universe that's still young, where gravity has just begun to pull matter together into stars and galaxies.

We can see something even more distant, and more ancient, than the first galaxies. If we peer out far enough, in between the galaxies, we can see parts of the Universe that are so far away, it has taken the light from that distance almost the entire age of the cosmos to reach us.

When we look at the most distant parts of the cosmos, in every direction, we see parts of the Universe that are so far in the past, they're still in the final stages of the Big Bang. So far away, so far back, the space is filled with a dense, roiling plasma, the fire of creation.

We are not the center of the Universe. But we are the center of our own perception as light reaches us from afar; we lie embedded in nesting-doll layers of cosmic time. Each concentric sphere is an era. We can see the structure of matter changing, like geological strata around us

The most distant layer of time that we can see is the light that has been traveling since the moment the primordial fire began to cool. The cosmic microwave background surrounds us at every edge of our vision. We are embedded in shells of cosmic time, and the final one is fire.