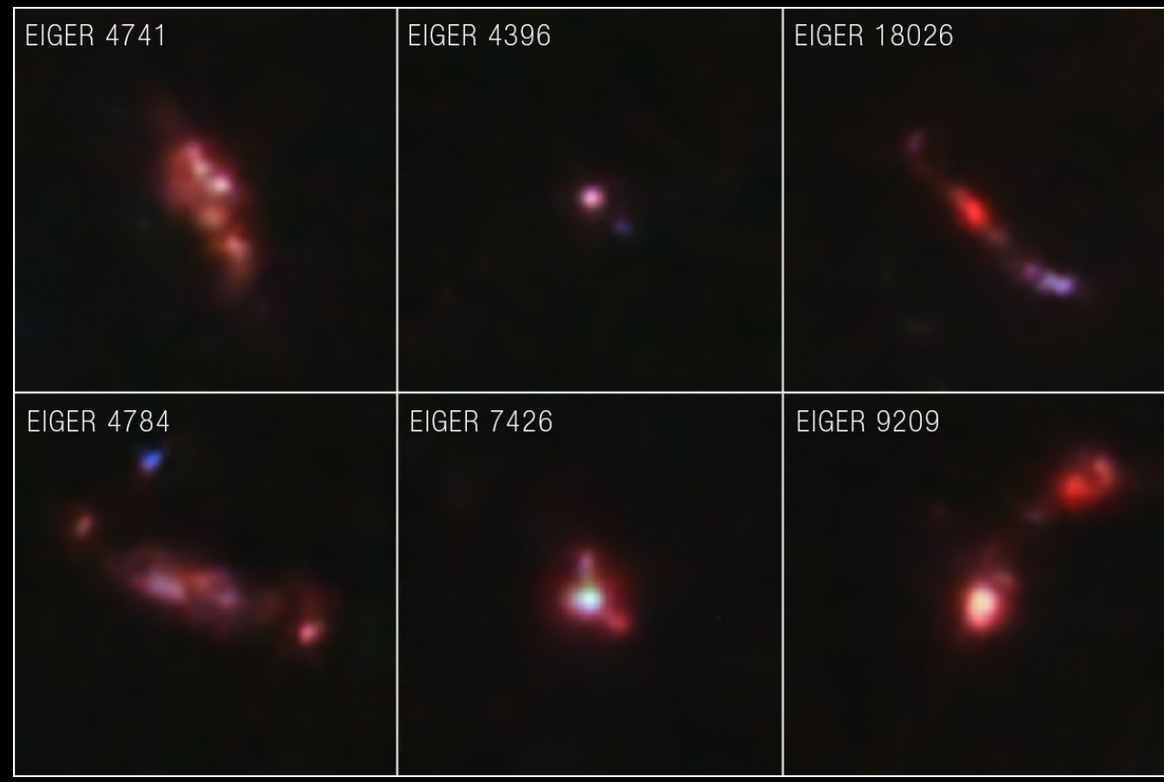
JWST Proves Galaxies Transformed the Early Universe

In the early universe, the gas between stars and galaxies was opaque – energetic starlight could not penetrate it. But about one billion years after the big bang, the gas became completely transparent, a period called the Era of Reionization. What happened to heat up the huge volume of gas between the galaxies?

New data from NASA's James Webb Space Telescope has pinpointed the reason: young stars in the galaxies emitted enough radiation to heat and ionize the gas around them, clearing our collective view over hundreds of millions of years.

These regions of transparent gas are gigantic compared to the galaxies – imagine a hot air balloon with a pea suspended inside. Webb's data shows that these relatively tiny galaxies drove reionization, clearing massive regions of space around them. Over the next hundred million years, these transparent "bubbles" continued to grow larger and larger, eventually merging and causing the entire universe to become transparent.



NASA's James Webb Space Telescope has returned extraordinarily detailed near-infrared images of galaxies that existed when the universe was only 900 million years old, including never-before-seen structures. These distant galaxies are clumpy, often elongated, and are actively forming stars.

Paper 1: https://iopscience.iop.org/article/10.3847/1538-4357/acc588
Paper 2: https://iopscience.iop.org/article/10.3847/1538-4357/acc846
Paper 3: https://iopscience.iop.org/article/10.3847/1538-4357/acd776
Feature: https://www.nasa.gov/feature/goddard/2023/nasa-s-webb-proves-galaxies-transformed-the-early-universe