

Observation of the oldest stars - what they tell us about our universe in its infancy

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The oldest stars have an age of about 13.2 billion years, not so far from the age of our universe of 13.7 billion years. Our sun is with an age of 4.6 billion years comparatively young. These oldest stars were discovered by Anna Frebel and coworkers. They are so interesting because they are probes of the universe at a very young age. When the first gas clouds condensed into stars about 300 million years after the big bang, the universe contained only the so-called primordial elements, hydrogen, helium, and a tiny amount of lithium. Many more elements up to iron were formed in the first generation of stars by fusion reactions. In some cases the iron cores of the first generation stars exploded as a so-called supernova, ejecting many elements into space in form of jets while eventually collapsing into a black hole. In the process many other elements were formed that determine the makeup of the 2nd generation of stars that are the objects of the talk. From their observation and the determination of their metallicity with e.g. instruments on board of the Hubble space telescope, we can learn about the specifics of the explosion of the first generation stars.