

Our Night Sky for May 20th, 2024

Last week I offered a simplified explanation of the process that powers our sun and also briefly touched on another stellar process, nucleosynthesis. This second process is how the universe builds heavier elements, and is the source of all matter.

As you move up in mass and temperature, heavier and heavier elements can be produced. Beyond a point normal sized stars can no longer fuse elements available to them and eventually they will erupt as a nova or super nova from much larger stars becoming unbalanced. But this also is where heavier elements are formed. The gold in your ring was formed in the heart of a super nova millions if not billions of years ago.

When the universe started it was entirely hydrogen. Hydrogen is the simplest atom and as pockets of denser and denser hydrogen formed, eventually fusion allowed stars to start producing light and building heavier elements, with a complex nuclear process called the Proton -proton chain. As millions of years go by and the available fuel is used up, the fusion reactions at the core can no longer support the enormous mass of the star and it collapses.

I have simplified years of research but the stellar processes are quite well understood. We can classify and chart stars on an H and R diagram. This plots a star's actual brightness against its color. This comparison allows a good understanding of how stars shine in Our Night Sky.