

Our sun, the superstar!

BY ROY E. GUSTAFSON

Popular Astronomy Club

Summer is gone and autumn finally has arrived. I hope you used sunscreen to protect yourself from sunburn this summer; because without protection, we can get skin cancer from exposure to too much sun, and this is certainly not a pleasant thing to have happen. The sun isn't doing this to be mean; it is merely doing its job of providing life-giving light energy to Earth.

This got me to thinking about the sun and some of the interesting facts that are hard for us, or at least me, to comprehend.

The sun really is just an average star, one that falls into the G class of spectral identification, but average to a star is far from average to the way we think. To us, the sun does some pretty unaverage things, and we are thankful it is 93 million miles away! The sun produces its energy by fusing 700 million tons of hydrogen into 695 million tons of helium every second with the release of a small amount of light energy! Each square centimeter of the solar surface emits as much light as a

6,000-watt light bulb. In order for this fusion to happen we must have high temperatures and pressures at the core of the sun, and boy, do we have this — 27 million degrees Fahrenheit and a pressure that is 250 billion times the atmospheric pressure here on Earth! All this thermonuclear activity produces turbulence and magnetic storms that dwarf any type of storms we have on Earth, storms that even dwarf Earth!

These storms are large because the sun is 864,000 miles in diameter compared to Earth at 7,926 miles in diameter. These storms produce the sunspots and solar prominences that are so beautiful to observe with a telescope that is equipped with proper eye protection. These storms can affect weather and communication here on Earth.

During a total solar eclipse, we can see the solar prominences emanating from the surface of the sun. The sun is ejecting material into space at a velocity of 1 million mph, and the sun is ejecting 100 million tons of this material every second! Even at this rate of hydrogen

depletion (conversion to helium) and mass ejection during electromagnetic storms, the sun is expected to last for another 4.6 billion years, which is as long as it has been in existence now.

The mass of the sun is tremendous; the sum of the weight of all the material in the planets, their moons, and asteroids is less than 1 percent of the sun's weight! Next year, on Aug. 21, we will be able to observe a partial solar eclipse from the Quad-Cities area with more than 90 percent of the sun covered by the moon!

The Popular Astronomy Club will be available to show the eclipse, so watch this newspaper and social media accounts to see where we will be set up for this fantastic event. If you want to see the total solar eclipse, then just go south to Carbondale and observe totality for 2 minutes and 41 seconds!

So ... when you are outside enjoying some sunshine and cool crisp fall air, think about this "average" star and the phenomenal things it is doing to provide that sunshine.