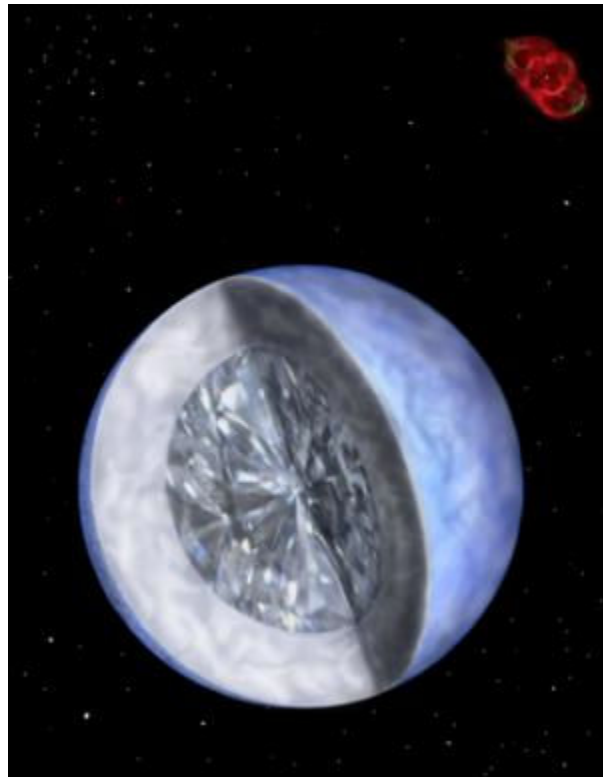


This Valentine's Day, Give The Woman Who Has Everything The Galaxy's Largest Diamond

Science Daily — Cambridge, MA -- When choosing a Valentine's Day gift for a wife or girlfriend, you can't go wrong with diamonds. If you really want to impress your favorite lady this Valentine's Day, get her the galaxy's largest diamond. But you'd better carry a deep wallet, because this 10 billion trillion trillion carat monster has a cost that's literally astronomical!

You would need a jeweler's loupe the size of the Sun to grade this diamond!" says astronomer Travis Metcalfe (Harvard-Smithsonian Center for Astrophysics), who leads a team of researchers that discovered the giant gem. "Bill Gates and Donald Trump together couldn't begin to afford it." When asked to estimate the value of the cosmic jewel, Ronald Winston, CEO of Harry Winston Inc., indicated that such a large diamond probably would depress the value of the market, stating, "Who knows? It may be a self-deflating prophecy because there is so much of it." He added, "It is definitely too big to wear!"

The newly discovered cosmic diamond is a chunk of crystallized carbon 50 light-years from the Earth in the constellation Centaurus. (A light-year is the distance light travels in a year, or about 6 trillion miles.) It is 2,500 miles across and weighs 5 million trillion trillion pounds, which translates to approximately 10 billion trillion trillion carats, or a one followed by 34 zeros.



"It's the mother of all diamonds!" says Metcalfe. "Some people refer to it as 'Lucy' in a tribute to the Beatles song 'Lucy In The Sky With Diamonds.'"

The diamond star completely outclasses the largest diamond on Earth, the 530-carat Star of Africa which resides in the Crown Jewels of England. The Star of Africa was cut from the largest diamond ever found on Earth, a 3,100-carat gem.

The huge cosmic gem (technically known as BPM 37093) is actually a crystallized white dwarf. A white dwarf is the hot core of a star, left over after the star uses up its nuclear fuel and dies. It is made mostly of carbon and is coated by a thin layer of hydrogen and helium gases.

For more than four decades, astronomers have thought that the interiors of white dwarfs crystallized, but obtaining direct evidence became possible only recently.

"The hunt for the crystal core of this white dwarf has been like the search for the Lost Dutchman's Mine. It was thought to exist for decades, but only now has it been located," says co-author Michael Montgomery (University of Cambridge).

The white dwarf studied by Metcalfe, Montgomery, and Antonio Kanaan (UFSC Brazil), is not only radiant but also harmonious. It rings like a gigantic gong, undergoing constant pulsations.

"By measuring those pulsations, we were able to study the hidden interior of the white dwarf, just like seismograph measurements of earthquakes allow geologists to study the interior of the Earth. We figured out that the carbon interior of this white dwarf has solidified to form the galaxy's largest diamond," says Metcalfe.

Our Sun will become a white dwarf when it dies 5 billion years from now. Some two billion years after that, the Sun's ember core will crystallize as well, leaving a giant diamond in the center of our solar system.

"Our Sun will become a diamond that truly is forever," says Metcalfe.

A paper announcing this discovery has been submitted to The Astrophysical Journal Letters for publication.

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

Note: This story has been adapted from a news release issued by Harvard-Smithsonian Center For Astrophysics.

Astronomers have discovered a diamond star weighing 10 billion trillion trillion carats. The cosmic gem is the crystallized carbon core of a white dwarf star. Credit: Travis Metcalfe and Ruth Bazinet, Harvard-Smithsonian Center for Astrophysics.