A BOOM STAR COMING OUR WAY

By Henry M. Holden

TWO STARS in a binary star system known as KIC 9832227, are believed to be on a collision course, and the resultant explosion could light up in the night sky and change how we view the constellation Cygnus.

The event is predicted to be observable with the naked eye even though the stars are 1 800 light years from Earth.

To put this in perspective, the two stars collided during the rule of Augustus, the first emperor in the early Roman Empire. That puts the event around the year 27BC, and now we are waiting to see the results, over 2 000 years later.

It could be one of the biggest astronomical events in years — a star explosion so intense it could change the night sky.

If the prediction is accurate, KIC 9832227 will increase its brightness by 10 000-fold and transform into what is known as a "luminous red nova," a special type of stellar collision with a distinctive red color easily visible with the naked eye. It will be the first-time scientists have been able to predict such an event.

"It's a one-in-a-million chance that you can predict an explosion," said Calvin College (in Grand Rapids), Michigan, Professor of Astronomy, Lawrence Molnar, the scientist behind the audacious forecast. "It's never been done before."

In 2013, Molnar noticed that the star's orbital period, the length of time it takes for a star to make one complete orbit around another object, was decreasing. The two stars whirl around each other every 11 hours. In other words, the stars were orbiting each other at a faster rate, indicating they were on a collision course.

Through thousands of computer calculations, Molnar was able to settle on a date for the merge: 2022, give or take a year.

Molnar and his students have been observing KIC 9832227 for several years now, along with fellow astronomers Karen Kinemuchi, from Apache Point Observatory, and Henry Kobulnicky, from University of Wyoming.

"My colleagues like to call it the 'Boom Star'," said Molnar.

Whether Molnar's prediction holds up in every respect or not, the event will offer unprecedented insight into what happens when binary stars merge. "It's a rare opportunity to study an immensely powerful event, step-by-step, right in front of our eyes."

DRAMATIC NIGHT SKY CHANGES

Molnar expects a patch of sky to change from darkness into one of the brightest dots in the night sky. If the calculations are correct, the explosion would be about as bright as Polaris, the North Star.

"The project is significant not only because of the scientific results, but also because it is likely to capture the imagination of people on the street," said Matt Walhout, dean for research and scholarship at Calvin College. "If the prediction is correct, then for the first time in history, parents will be able to point to a dark spot in the sky and say, 'Watch, kids, there's a star hiding in there, but soon it's going to light up.'"

"It will be a very dramatic change in the sky, as anyone can see it" said Molnar. "You won't need a telescope to tell me in 2023 whether I was wrong or I was right."

Skeptics are saying don't make firm plans around watching the event. Not only is there no exact date beyond 2022— give or take a year — but no one has ever really made a prediction of this nature before.

Molnar's research assistant, Daniel Van Noord, found that the two stars in the system shared an atmosphere, "Like two peanuts sharing a single shell," Molnar said.

"Bottom line is we really think our merging star hypothesis should be taken seriously right now. We should be using the next few years to study this intensely so that if it does blow up we will know what led to that explosion," Molnar said. →

Scientists are expecting that the collision of, the binary star system KIC 9832227 and the resultant explosion could light up in the night sky and produce a red nova. The red nova is characterised by a distinct red colour, and a light curve that lingers with resurgent brightness in the infrared. (Credit NASA)