A disc of gas would explain mysterious light changes observed in Sagittarius constellation

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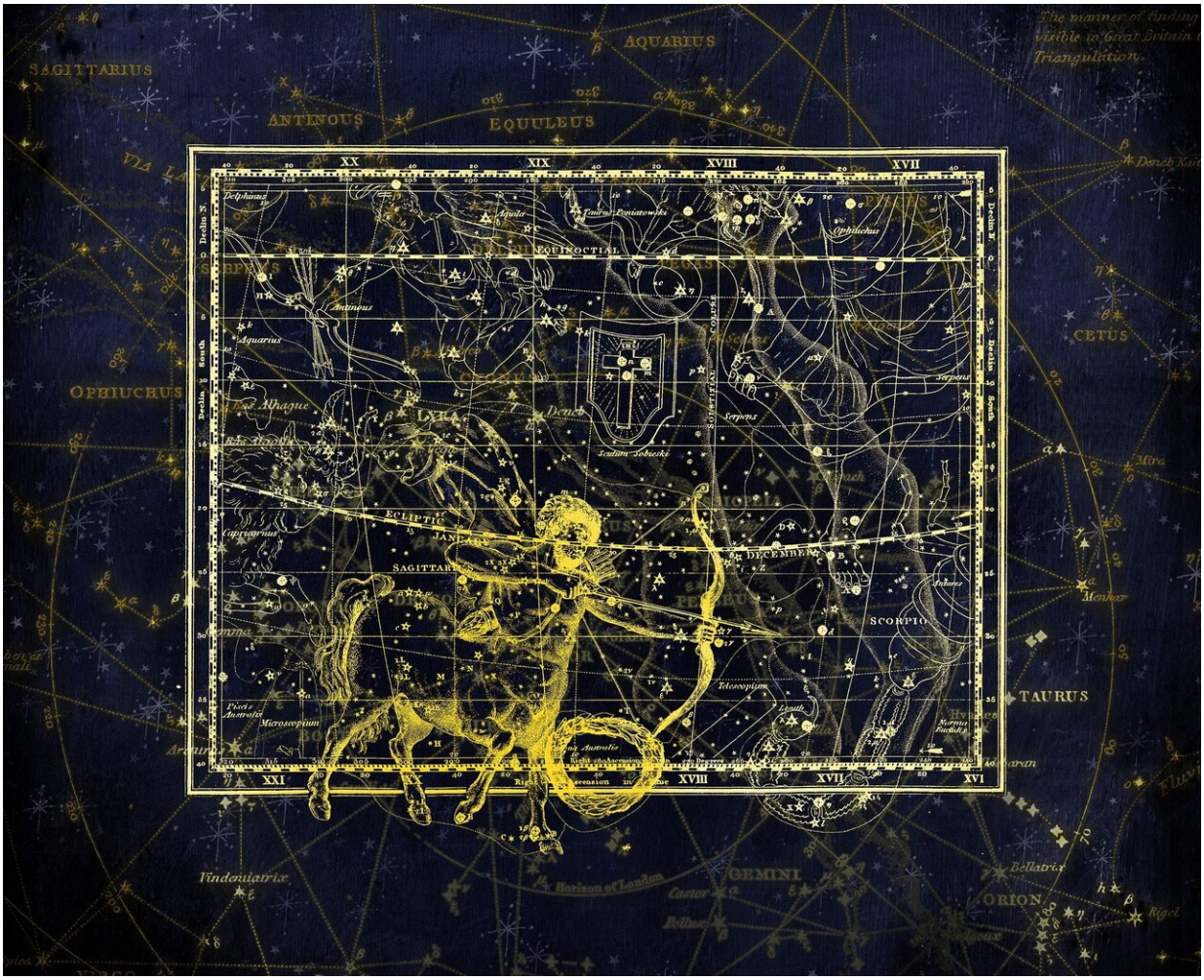

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The enigmatic variations of light in a binary system, located in Sagittarius constellation, could be explained by the presence of a variable gas disc around a hot star that revolves around a cooler star. These are the conclusions of researchers from Chile, Serbia and Poland, and published in the journal *Astronomy & Astrophysics*.

The binary system OGLE-BLG-ECL-157529, located at 10.567 light years from Earth, had been reported in a catalog of binary stars in the direction of the Galactic center. The system showed a peculiar variation in its brightness, with a period close to 800 days, together with typical changes of an eclipsing binary star of 24.8 days. The data analyzed cover 18.5 years and were obtained at the Las Campanas observatory in Chile, as part of the Polish OGLE project.

The object was identified as a binary star, whose cooler and evolved star transfers mass to the hottest star, forming around it a disc of gas with about 30 solar radii of extension. The disc would have a temperature of about 3.000 Kelvin, and it would undergo changes in its size and temperature as a result of variations in the amount of material it receives from the cold star.

The team of researchers included Ronald Mennickent, Juan Garcés, and Dominik Schleicher, from the Department of Astronomy of University of Concepción; Gojko Djurasevic, from the Astronomical Observatory Volgina; and Patryk Iwanek, Radoslaw Poleski, and Igor Soszyski, from the University of Warsaw.

The article shows how changes in disc properties convincingly explain the changes in the brightness of the binary system. In particular, this system shows strange variations in the depth of its eclipses which can be explained by the evolution of this gaseous disk, according to the authors. "Many stars in the universe are binary, and the most massive ones go through these mass transfer processes, which dramatically conditions

their evolution. These objects can produce, in the distant future, supernovae or even emitters of gravitational radiation," Dr. Mennickent explains.

More information: R.E. Mennickent et al, Long photometric cycle and disk evolution in the beta Lyrae-type binary OGLE-BLG-ECL-157529, *Astronomy & Astrophysics* (2020). DOI: 10.1051/0004-6361/202038110

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