Astrophysicists 'weigh' galaxy's most massive star

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Theoretical models of stellar formation propose the existence of very massive stars that can attain up to 150 times the mass of our Sun.

Until very recently, however, no scientist had discovered a star of more than 83 solar masses. Now an international team of astrophysicists, led by Université de Montréal researchers from the Centre de recherche en astrophysique du Québec (CRAQ), has found and "weighed" the most massive star to date.

Olivier Schnurr, Jules Casoli and André-Nicolas Chené, all graduates of the Université de Montréal, and professors Anthony F. J. Moffat and Nicole St-Louis, successfully "weighed" a star of a binary system with a mass 116 times greater than that of the Sun, waltzing with a companion of 89 solar masses, doubly beating the previous record and breaking the symbolic barrier of 100 solar masses for the first time.

Located in the massive star cluster NGC 3603, the supermassive star system, known under the name of A1, has a rotation period of 3.77 days. The masses were calculated by a combination of observations made with the SINFONI instrument, an integral field spectrograph operating on the Very Large Telescope on the site of the European Organisation for Astronomical Research in the Southern Hemisphere (ESO) in Chile, and infrared images coming from the Hubble Space Telescope.

The stars forming the A1 system are so massive and bright that the light they transmit shows characteristics that only "Wolf-Rayet" stars possess.

Within the context of this work, a binary system transmitting X-rays at a power almost never seen in our Galaxy was also discovered near NGC 3603-A1.

Notes: NGC 3603 (entry number 3603 of the New General Catalogue) is a giant HII region in the Constellation Carina, in the Carina arm of our spiral Galaxy, the Milky Way, about 20,000 light years from the Sun. It was discovered by John Frederick William Herschel in 1834. NGC 3603 has an open cluster at its centre that contains approximately 2,000 bright and massive stars.

A Wolf-Rayet star is a hot, massive and evolved star exhibiting a very high loss of mass due to a strong stellar wind (similar to the solar wind).

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