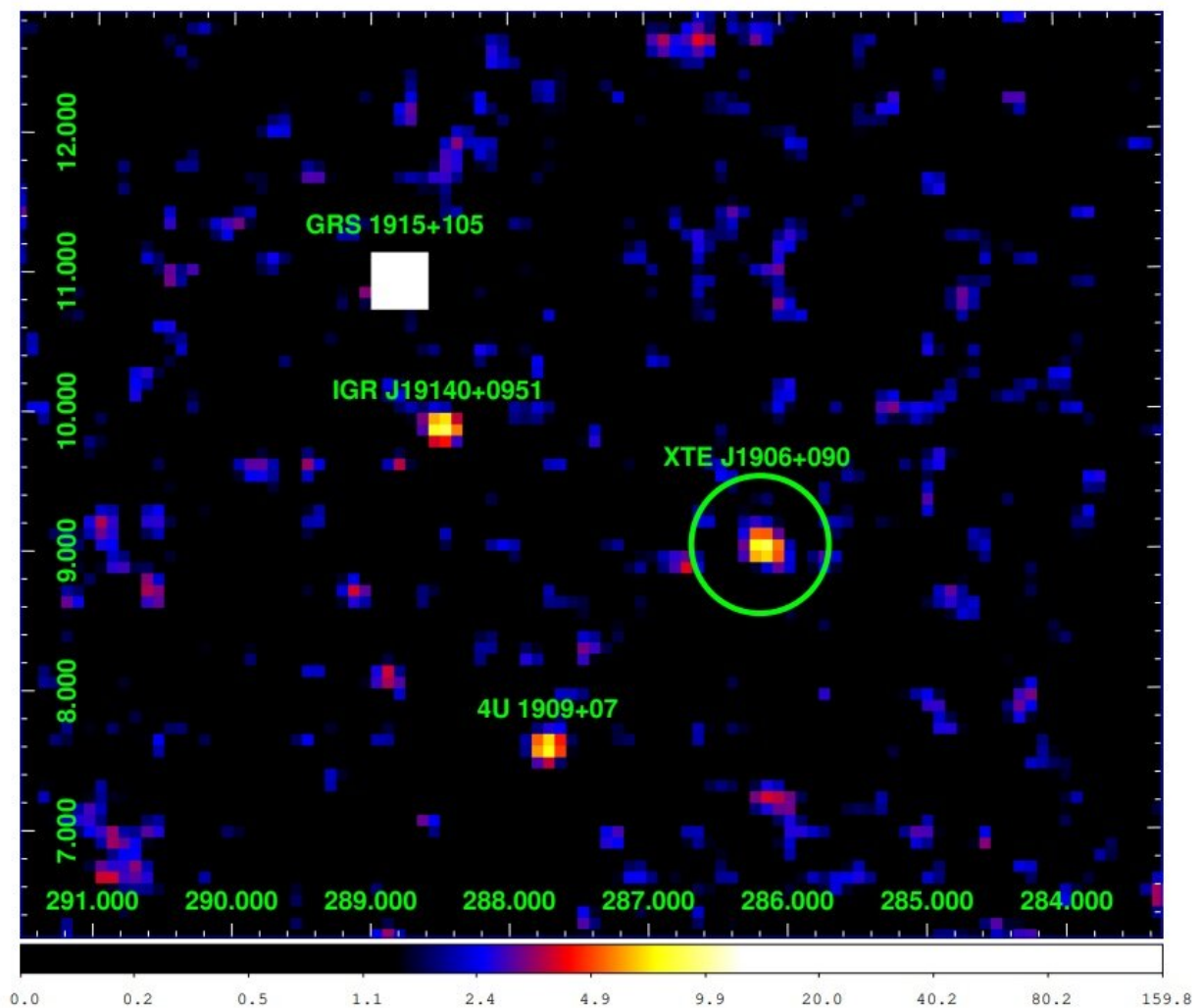


# XTE J1906+090 is a persistent low-luminosity Be X-ray binary, study suggests

May 18 2023, by Tomasz Nowakowski



IBIS/ISGRI 18–60 keV significance map (revolutions 972+973), XTE J1906+090 (green circle) is detected. Credit: Sguera et al, 2023

Using INTEGRAL and Swift spacecraft, European astronomers have observed an unidentified X-ray source known as XTE J1906+090. Results of the observational campaign, presented May 11 on the *arXiv* preprint server, suggest that this source belongs to the small and rare group of persistent low-luminosity Be X-ray binaries.

X-ray binaries are composed of a normal star or a white dwarf transferring mass onto a compact neutron star or a black hole. Based on the mass of the companion star, astronomers divide them into low-mass X-ray binaries (LMXB) and high-mass X-ray binaries (HMXB).

Of special interest are Be/X-ray binaries (BeXRBs), a subclass of HMXBs in which the optical star is a dwarf, subgiant or giant OBe star. Studying X-ray outbursts from BeXRBs could be essential in order to improve our understanding of the nature of X-ray binaries and their behavior.

XTE J1906+090 was first detected in 1996 with the Rossi X-ray Timing Explorer (RXTE) spacecraft and initially classified as an unidentified transient X-ray pulsar with a spin period of about 89 seconds. Previous studies of XTE J1906+090 have suggested that it may be a BeXRB system at a distance of some 33,000 [light years](#), however due to the lack of optical and [infrared spectroscopy](#), it was difficult to confirm this.

Now, based on the data from the INTErnational Gamma-Ray Astrophysics Laboratory (INTEGRAL) and from the Neil Gehrels Swift Observatory, a team of astronomers led by Vito Sguera of the Astrophysics and Space Science Observatory of Bologna, Italy, has provided further evidence supporting the BeXRB scenario for XTE J1906+090.

According to the study, XTE J1906+090 has been consistently detected by Swift at a persistent low X-ray luminosity value of about 10 to 40

decillion erg/s, with limited variability. Therefore, the X-ray characteristics of this source, together with its long spin period, strongly resemble those of persistent low-luminosity BeXRBs, which are a small and rare subgroup of peculiar BeXRBs.

"Such properties suggest that the compact object orbits the donor Be star in a wide ([orbital periods](#) longer than  $\sim 30$  days) and nearly circular (e

Citation: XTE J1906+090 is a persistent low-luminosity Be X-ray binary, study suggests (2023, May 18) retrieved 18 June 2024 from <https://phys.org/news/2023-05-xte-j1906090-persistent-low-luminosity-x-ray.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.