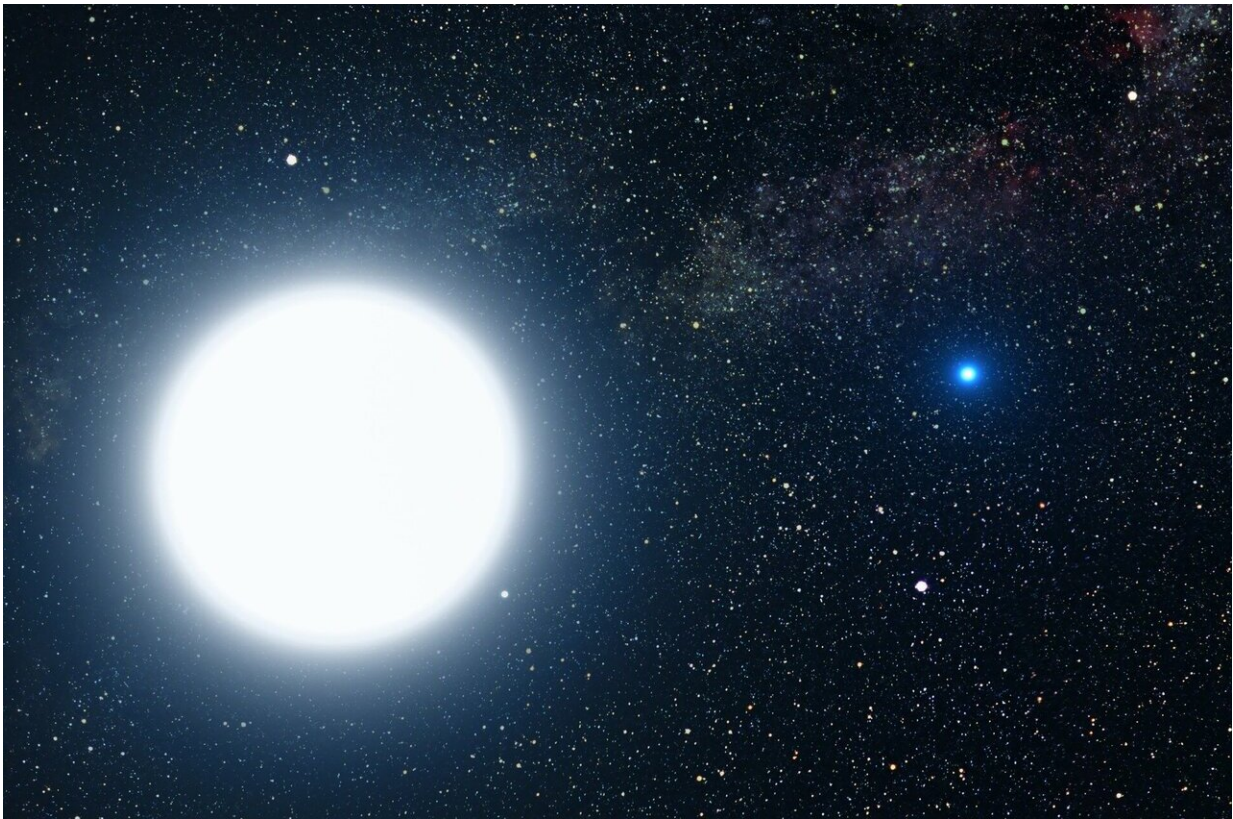


# Researchers find 12 semidetached mass-transfer massive binaries in galaxy M31

April 15 2022

---



Credit: Pixabay/CC0 Public Domain

Recently, PhD student Li Fuxing, Prof. Qian Shengbang and their colleagues from Yunnan Observatories of the Chinese Academy of Sciences discovered 12 semidetached mass-transfer massive binaries

from a total of 437 eclipsing binaries in Andromeda galaxy (M31). The secondary (less massive) components filled their Roche lobes, while the more massive ones were detached from the lobes.

Their findings were published in *The Astronomical Journal* on April 8.

M31 is the closest spiral galaxy to the Milky Way and the largest galaxy in the Local Group. Its structure and metallicity are very close to that of the Milky Way.

Since M31 is far away from the Earth, most of the eclipsing binaries obtained in M31 are massive binaries, and only a few binaries have been investigated for the distance modulus of M31. Therefore, whether the structural characteristics and evolutionary state of these binaries are the same as those of massive binaries in the Milky Way remains poorly understood.

In this study, the researchers have found that the relationship between the mass ratio and the fill-out factor of the primary star reveals that they are in the stage of slow mass transfer from less massive components to their companions with the reversed [mass ratio](#).

Meanwhile, the [temperature distribution](#) of primary and secondary stars of these binaries is similar to that of semidetached binaries in the Milky Way.

These facts suggest that the evolution of massive binaries in M31 should be similar to that in the Milky Way, which provides a valuable test of the evolutionary models of mass transfer of massive binaries.

**More information:** F.-X. Li et al, Semidetached Mass-transfer Massive Binaries in the Nearby Galaxy M31, *The Astronomical Journal* (2022). [DOI: 10.3847/1538-3881/ac5685](https://doi.org/10.3847/1538-3881/ac5685)

Provided by Chinese Academy of Sciences

Citation: Researchers find 12 semidetached mass-transfer massive binaries in galaxy M31 (2022, April 15) retrieved 11 May 2024 from <https://phys.org/news/2022-04-semidetached-mass-transfer-massive-binaries-galaxy.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.