EXOPLANETS

Do you c me?

Astron. Astrophys. <https://doi.org/10.1051/0004-6361/202037594> (2020)

Credit: A&A

A tantalising glimpse of what might turn out to be the second planet around the closest star to the Sun, Proxima Centauri, has been captured by the SPHERE instrument on the Very Large Telescope. Raffaele Gratton and colleagues have analysed data collected over a period of four years by the SHINE survey, and find a 6σ -detection in the combined image that coincides with the expected position of candidate planet Proxima c (~ 1.5 au; Damasso et al. *Sci. Adv.* **6**, eaax7467; 2020). However, the detection is not fully certain because the candidate's motion does not fit with the current best measurement of the astrometric motion of the host star.

Gratton et al. focused on phases of the orbit close to quadrature (the annulus on the sky where the orbiting body appears to move most slowly, marked with green dashed lines in the image). They found a high signal-to-noise match in a sequence of images from April 2018, and fitted an orbit

inclined at 120° (magenta dashed line). The mass of this planet candidate was calculated to be $7.2 \pm 2.2 M_{\oplus}$.

However, the average contrast of the peak seen in the combined SPHERE images suggests an object that is approximately five times the size of Jupiter. A possible solution for the discrepancy is that the planet candidate is surrounded by dust clouds or a system of expansive rings much like Saturn's. In addition, according to Gaia DR2 astrometry, the star is moving in the opposite direction to that expected from the planet candidate's gravitational tug. A distant undetected massive planet might resolve this issue. Gaia DR3 should hopefully provide some clarity.

Paul Woods

Published online: 6 May 2020
<https://doi.org/10.1038/s41550-020-1112-5>