

## Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



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### Can the S2-star harbor a planetary companion?

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The Galactic Center contains a dense cluster of massive stars orbiting the central supermassive black hole, Sagittarius A<sup>\*</sup>, collectively known as the S-cluster. While massive stars elsewhere in the Galaxy frequently reside in binary systems, the S-cluster appears to lack such companions. Among the S-cluster stars is S2, one of the most well-studied due to its close approach to Sagittarius A<sup>\*</sup>, which enables tests of General Relativity. In this study, we investigate the dynamical viability of planetary companions orbiting S2 under the extreme gravitational influence of Sagittarius A<sup>\*</sup>. Our findings provide insight into the survivability of planetary systems in the Galactic Center and guide future observational efforts to detect exoplanets in this unique environment.

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