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An Extremely Wide Companion Candidate to a Nearby M-dwarf System MICHAELA GUZZETTI, Smith College, KIMBERLY WARD-DUONG, Amherst College, ROBERT DE ROSA, European Southern Observatory, JENNY PATIENCE, Arizona State University, KATE FOLLETTE, Amherst College, SUZAN EDWARDS, Smith College, DON MCCARTHY, CRAIG KULESA, University of Arizona — Low-mass M-dwarfs comprise over 70% of nearby stars, and their occurrence rates in multiple systems provide important diagnostics of the star formation process. Yet, the frequency of their brown dwarf companions objects too low in mass to burn hydrogen like stars, yet too massive to be planets is uncertain. It is difficult to ascertain fundamental parameters such as mass and age for isolated brown dwarfs due to the fact they cool and dim throughout their lifetimes. Thus, a wide brown dwarf orbiting an M-dwarf system presents an invaluable laboratory to explore formation and evolution processes. We present one such system consisting of a closely-separated (15 AU) M-dwarf binary with a candidate substellar companion at a remarkable distance of 7700 AU. We use near-infrared spectra from the ARIES instrument on the MMT Observatory and photometric analysis to determine spectral types of the wide companion candidate and each star in the binary pair. We measure astrometry using Gaia kinematics and archival widefield photographic plates to determine whether the companion is physically bound to the binary. If confirmed, this system will be one of the widest known brown dwarf companions to an M-dwarf system and an important benchmark for the study of low-mass multiple star formation.

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