

Abstract Submitted
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Testing Theories of Gravity Using Galactic Center Stars DAVID MERRITT, Rochester Institute of Technology, SEPPO MIKKOLA, Tuorla Observatory, Turku, CLIFFORD WILL, Washington University, St. Louis, TAL ALEXANDER, Weizmann Institute, Israel, STEFAN HARFST, University of Amsterdam — Stars orbiting very close to the supermassive black hole at the center of the Milky Way will experience precession of their orbital planes induced by relativistic frame dragging and by the quadrupolar gravity of the hole, at levels that are potentially observable using adaptive optics on the next generation of large ground-based telescopes. Astrometric observations of the orbits of at least two such stars can in principle lead to a determination of the angular momentum vector of the black hole and its quadrupole moment, allowing a test of the general relativistic no-hair theorems. We present the first relativistic N-body simulations of stellar motions around the Milky Way black hole and evaluate the degree to which orbital precession would be influenced by Newtonian perturbations from other stars and from compact stellar remnants.

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