

Abstract Submitted
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Testing the general relativistic “no-hair” theorems using the galactic center black hole SgrA*¹ CLIFFORD M. WILL, Washington University, St. Louis — If a class of stars orbits the central black hole in our galaxy in short period (~ 0.1 year), high eccentricity (~ 0.9) orbits, they will experience precessions of their orbital planes induced by both relativistic frame-dragging and the quadrupolar gravity of the hole, at levels that could be as large as $10 \mu\text{arcseconds}$ per year, if the black hole is rotating faster than $1/2$ of its maximum rotation rate. Astrometric observations of the orbits of at least two such stars can in principle lead to a determination of the angular momentum vector \mathbf{J} of the black hole and its quadrupole moment Q_2 . This could lead to a test of the general relativistic no-hair theorems, which demand that $Q_2 = -J^2/M$. Future high-precision adaptive infrared optics instruments may make such a fundamental test of the black-hole paradigm possible.

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