Relativity in Fundamental Astronomy
Proceedings IAU Symposium No. 261, 2009
S. A. Klioner, P. K. Seidelman & M. H. Soffel, eds.

doi:10.1017/S1743921309990494

The galactic center: The ideal laboratory for studying supermassive black holes

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Abstract. The Galactic Center constitutes the best astrophysical evidence for the existence of black holes, and it is the ideal laboratory for studying physics in the vicinity of such objects. The combination of infrared observations of three dimensional orbits of stars within the central light days and the extreme compactness and motionlessness of the radio-counterpart of the gravitational center have shown beyond any reasonable doubt that the Galactic Center harbors a supermassive black hole. The flaring activity from the black hole gives first insights to the physical processes close to the last stable orbit. Here I review the current state of observations and theory of the Galactic Center black hole and give an update on the latest results. I also outline the next steps towards even higher angular resolution observations, which give promise to directly probe the physics and space-time curvature just outside the event horizon.

Keywords. Galaxy: center, black hole physics, relativity, techniques: high angular resolution, interferometric

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