

## Spanish and Portuguese Relativity Meeting



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# The Galactic Center as a gravitational laboratory

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The centre of the Milky Way has been subject of an intense observational program throughout the last thirty years, leading to exhibit the existence of a point source supermassive object named Sagittarius A (*Sgr A*). While stars orbiting around it are accelerated by gravity up to speeds of 10.000 km/s, *Sgr A* moves at less than 1 km/s. *The kinematic properties of such stars, called S-stars, set up its mass to about 4 million solar masses, concentrated in a region of only six light hours. The study of the motion of these stars and the potential future discovery of pulsars orbiting Sgr A* allows to probe the gravitational field of a supermassive black hole in a regime that had never been explored before. In this talk I will discuss the new avenue opened by such observations to test alternative to the classical Schwarzschild black hole model.

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