



## *Joint Physics & IA/FORTH Colloquium*

Thursday, 22 April 2021 | 17:00 – 18:00, Online Colloquium

### **Exploration of the supermassive black hole at the Galactic Center with GRAVITY**

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#### **ABSTRACT**

*The existence of black holes has been predicted for a few centuries now, even before the discovery of general relativity by Albert Einstein.*

*Their extreme compactness makes their study at the horizon scale extremely difficult. Sagittarius A\*, at the center of our galaxy, is the black hole with the largest apparent size. A European collaboration has built GRAVITY, an instrument of the Very Large Telescope Interferometer at ESO to study Sgr A\* (the specifications of GRAVITY were tailored to this particular science case). GRAVITY allows to reach unprecedented spatial scales for such an object. Direct tests of the black paradigm as well as of general relativity in the strong regime become possible. I will present the current status of the measurements and the results achieved so far. In particular the measurements carried out with the star S2, which allowed to test general relativity and to constrain important parameters of the black hole and its environment. I will also present measurements of flares, which allowed to probe the region close to the event horizon. Sgr A\* is one of many supermassive black holes and GRAVITY allowed to obtain unprecedented results on a quasar and AGNs. I will conclude with the prospects with GRAVITY and its upgrade in this field of research and others.*

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