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Insights into the the Galactic Center environment from VHE gamma-ray observations with ground-based facilities

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The dynamic center of our galaxy is known to host a source of TeV gamma rays since the very beginning of the 21st century and a link to the supermassive black hole at the Galactic Center has been speculated on ever since. But not only the point-like source, spatially coincident with SgrA*, can be observed from the ground using the Imaging Air Cherenkov Telescope technique, but also diffuse emission from the vicinity, spanning more than one degree along the Galactic plane and emitting a remarkably hard energy spectrum, reaching energies well beyond 10 TeV.

Recent observations by the H.E.S.S., MAGIC and VERITAS facilities have enabled detailed studies of the dynamics of high-energy particles in Galactic Center region that indicate a link between the diffuse component and central point-like gamma-ray source. These studies suggest the presence of a powerful cosmic-ray accelerator in close proximity to SgrA*. This could potentially even be one of the long-sought-after Galactic PeVatrons, needed in order to explain the cosmic-ray spectrum up to the the feature called 'knee' at around 10^{15} eV.

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