Observations of the Galactic Center Region

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Extremely complex, busy environment:
  - SMBH SgrA*
  - Numerous PWN, SNe, MC
  - Diffusion of energetic particles throughout

2013-2018: G2 Molecular cloud infall into central accretor....
HESS (>300 GeV)

Pt Sources
Subtracted
>70 hours of livetime observations so far
- Energy threshold for observations is ~2 TeV
- Multiple sources: SgrA*, G0.9+0.1, Diffuse emission...
Total VERITAS Observations

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Preliminary
- Believed 4e9 SMBH coinciding with radio source SgrA* 
- VERITAS detection at $\sim 25\sigma$ above 2 TeV 
- Spectrum/position agrees with HESS 
- Paper to be submitted to ApJ shortly
2010-2013: No evidence for flux variability. Need continued monitoring during G2 passage....
Current VERITAS/HESS spectral measurements cannot distinguish between hadronic/leptonic models for emission, however- key distinguishing feature is >10 TeV emission: VERITAS is in key position to measure this component and look for variability or hardening.
Composite radio SNR housing X-ray plerionic core
-No LAT detection, HESS detection in 2005
HESS Source: Weak (2% Crab) emission >200 GeV detected, coincident with PWN core (assumed Crab nebula-like emission)
VERITAS now detects G0.9+0.1 at $\sim 7\sigma$ above 2 TeV

Spectral analysis in progress....
VERITAS Diffuse Component

VERITAS $>2$ TeV traces CO emission reasonably well.
Work in progress to extract true diffuse component.

Fermi-LAT
GC region is extremely rich environment for TeV activity- VERITAS detects multiple individual sources as well as diffuse emission

SgrA* detection/spectrum paper soon to be submitted

In depth study on >10 TeV variability as well as diffuse emission in progress