

VERITAS: ground-based gamma-ray astrophysics

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VERITAS Operations:

- Most sensitive VHE (50 GeV – 50 TeV) gamma-ray detector viewing the Northern Sky
- In full operation since 2007 with > 10000 hours on-sky
- Operations foreseen through Fall 2019
- >1000 hours of observations/year with efficiency > 90%.
- Currently 57 VHE detections (total number of known VHE sources: 198)
- Multi-wavelength/multi-messenger operations with X-ray, optical, ν , GW

McGill VERITAS group:

- Two faculty (D. Hanna, K. Ragan), 2 PDF, 2 MSc, 2 PhD
- Good place to train HQP:
 - Over last five years: 3 PDF, 3 PhD, 2 MSc, 8 undergrads.
 - Since start of project: ~8 PDF, 7 PhD, 8 MSc, 15 undergrads.
- Received 3-year NSERC Project Grant renewal 2016-2019, at ~ flat funding
- Just completed a ‘stacked’ search for DM from dwarf spheroidals; leading the analyses for:
 - search for primordial black holes;
 - measurement of the high energy e^+/e^- spectrum;
 - searches for Lorentz-invariance violation.

McGill contributions to VERITAS hardware:

- Mirror mounts
- Programmable trigger delays
- Mirror alignment tool |
- Calibration flasher systems | MSc projects
- Reflectivity measurement system |

VERITAS Future/Upgrades:

- VHE operations foreseen through Fall 2019 (two more complete seasons)
- Currently investigating options (and entertaining proposals) for use of array after that time
- Examples:
 - Dedicated searches for (optical) transients such as X-ray binary flares or Kuiper-belt star occultations
 - Use for optical interferometry (milli-arcsecond resolution)
 - Use for deep-space communication