1. Committees
   – VERITAS External Oversight Committee (ESAC)
   – INTEGRAL Time Allocation Committee
   – NASA Structure and Evolution of the Universe Advisory Committee

2. Colloquia

3. Programmatics

4. Science
GLAST-related Publications

Recent papers

   - X-ray knots and hot spots observed with Chandra
   - Solves collimation and bulk Compton radiation problems
   - Neutrino production
3. GRB Jets and the Curvature Relation (CD ApJ 20004)
5. Cosmic Rays from GRBs in the Galaxy (Holmes and CD, in preparation, 20004)
Gamma Rays from Relativistic Jets

Predictions for GLAST

1. Signatures of Hadrons in GRBs
   – Prompt hadronic cascade emission components
   – Delayed hyper-relativistic synchrotron emission from ultra-relativistic electrons formed as neutron secondaries

2. Hadronic $\gamma$-ray emission in Blazar Spectra
   – Correlated with Neutrino Production
   – Testable with Joint GLAST/IceCube Neutrino Telescope Observations

3. High Energy Cosmic Rays from GRBs
   – Neutron-decay X-ray/$\gamma$-ray synchrotron halos around star-forming and GRB-active galaxies
   – Neutrinos from GRBs
TeV Radiation from the Galactic Center Black-Hole Plerion

New work to interpret HESS results on TeV Emission from the Galactic Center


Termination shock

Wind from ADAF

\[ \dot{m} \]

\[ \dot{m} \]

Magnetized Corona (the ADAF)
New Concept: the Black Hole Plerion

Particle escape by convective outflow in advection-dominated inflow-outflow source (ADIOS) extension (Blandford & Begelman 1999) of ADAF model.

Assume a wind power

\[ L_{\text{wind}} = 10^{37} L_{37} \text{ ergs s}^{-1} \]

With speed \( v_{\text{wind}} \approx c/2 \) directed into solid angle \( \Omega \approx 1 \text{ sr} \)

Wind terminates at a subrelativistic shock at

\[ R_{\text{shock}} \approx 3 \times 10^{16} L_{37}^{1/2} \Omega_w^{-1/2} \text{ cm} \]

found by equating thermal gas pressure with energy density of wind

Electrons and protons accelerated by first-order (shock) Fermi acceleration.
Electrons emit X-ray synchrotron radiation to form quiescent X-ray emission and Compton scatter
- ADAF emission
- \( 10^{13} \) Hz emission from cold dust ring around Sgr A*
- Wind from the Plerion powers Sgr A West

6 cm VLA radio of Sgr A East and Sgr A West
(Yusef-Zadeh, Melia, & Wandle 2000.)

Inner Sagittarius region (4' x 3')
Galactic Center Black Hole Emission:
Sgr A* ADAF + Black-Hole Plerion + Sgr A West, a black-hole remnant

Predict GLAST detection of quasi-stationary Compton and bremsstrahlung fluxes from pc-scale plerion.

Propagation of GeV electrons power Sgr A West EGRET emission from young pulsar.
Flares from instabilities in accretion flow that form shocks at few $r_s$
First-order Fermi shock acceleration injects electrons with $\gamma < 10^6$, -2.2 injection index
Explains X-ray/NIR flares and short variability timescales from cooling and expansion
Self-absorbed flares at $< 100$ GHz from same electrons in “expanding source” scenario
Plans for Next Six Months

1. Presentations on GLAST-related Science
   U. Kansas (November 2004)
   NRAO Charlottesville (January 2004)
   AAS San Diego (January 2004)
   KITP Institute (May 2005)

2. Assist Julie McEnery in updating GLAST brochure

3. Gamma-ray Astronomy in the SEUS/Universe Roadmap