

The Next Steps in Space-Based Gamma-Ray Astronomy

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on behalf of the
Gamma-ray Science Interest Group (GammaSIG)
AAS - January, 2016

Operating PCOS/GammaSIG Missions



Fermi / GLAST

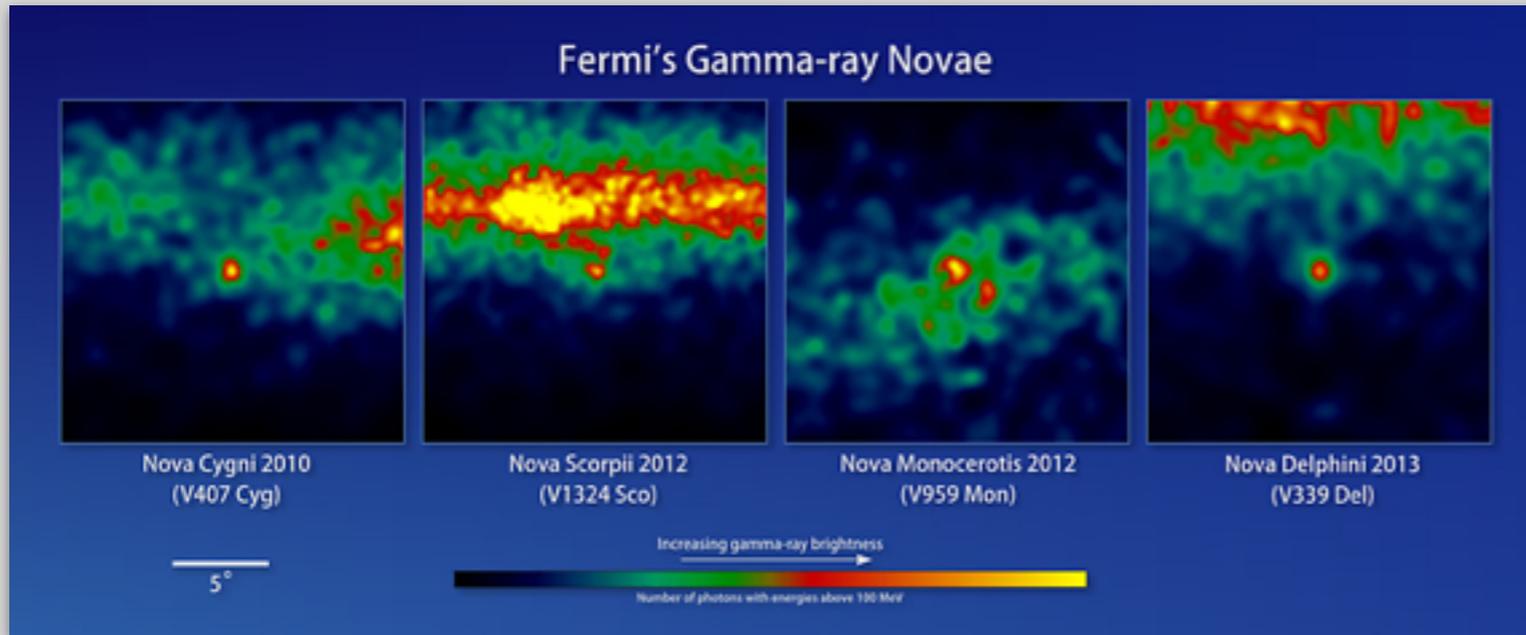
launched Jun 11, 2008
mission extended thru FY 2016
LAT (30 MeV - 300 GeV)
GBM (8 keV - 30 MeV)



INTEGRAL

“past mission”
launched Oct 7, 2002
mission extended thru 2016
IBIS (15 keV - 10 MeV)
SPI (20 keV - 8 MeV)

Recent Fermi Highlights

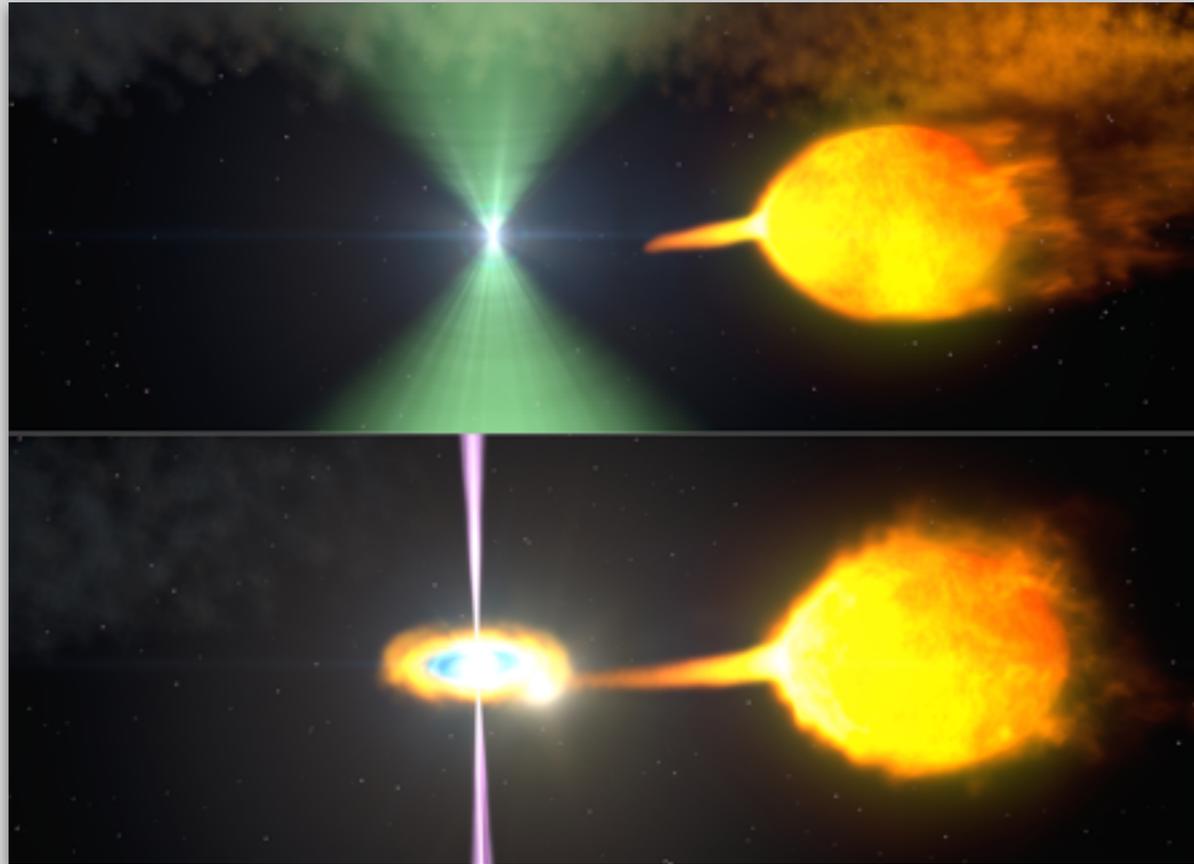


LAT detection of gamma rays from 4 classical novae show that gamma rays are generated in different progenitor systems
(Ackermann et al. 2014)
NASA Press Release 7/31/14



GBM detection of QPOs from burst storm of SGR J1550-5418 in 2009.
(Huppenkothen et al. 2014)
NASA Press Release 10/21/14

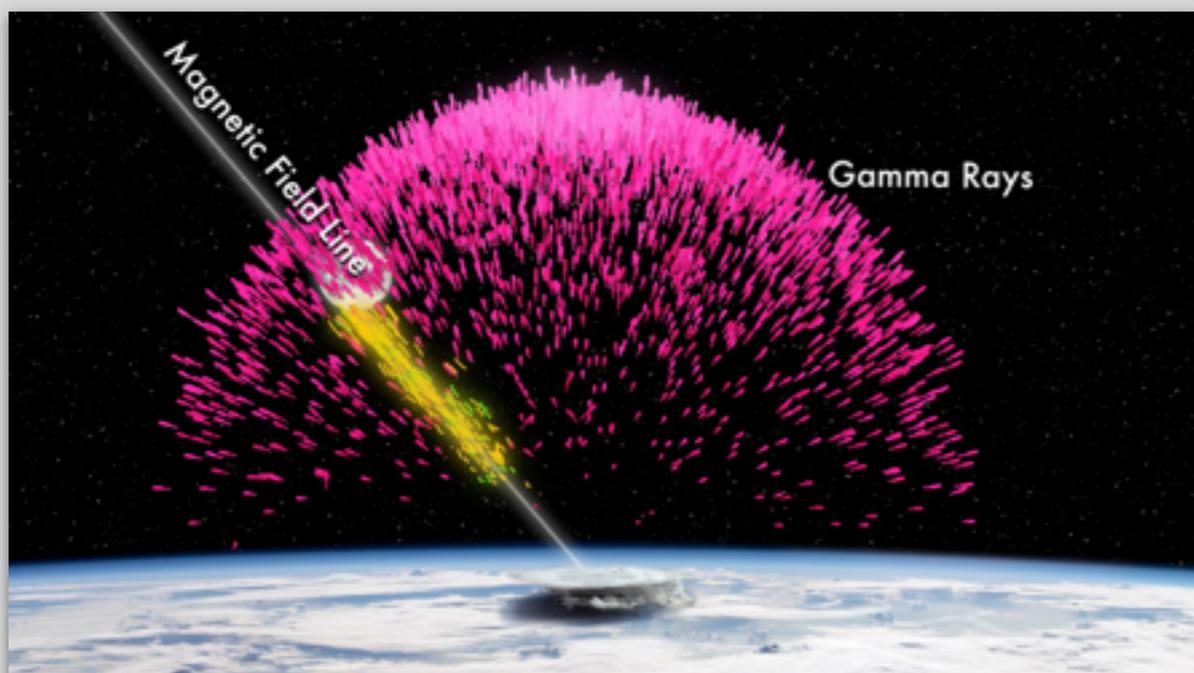
Recent Fermi Highlights



LAT observed a state change in PSR J1023+0038 in which the radio emission vanished and the gamma-ray emission increased by 5x.

(Stappers et al. 2014)

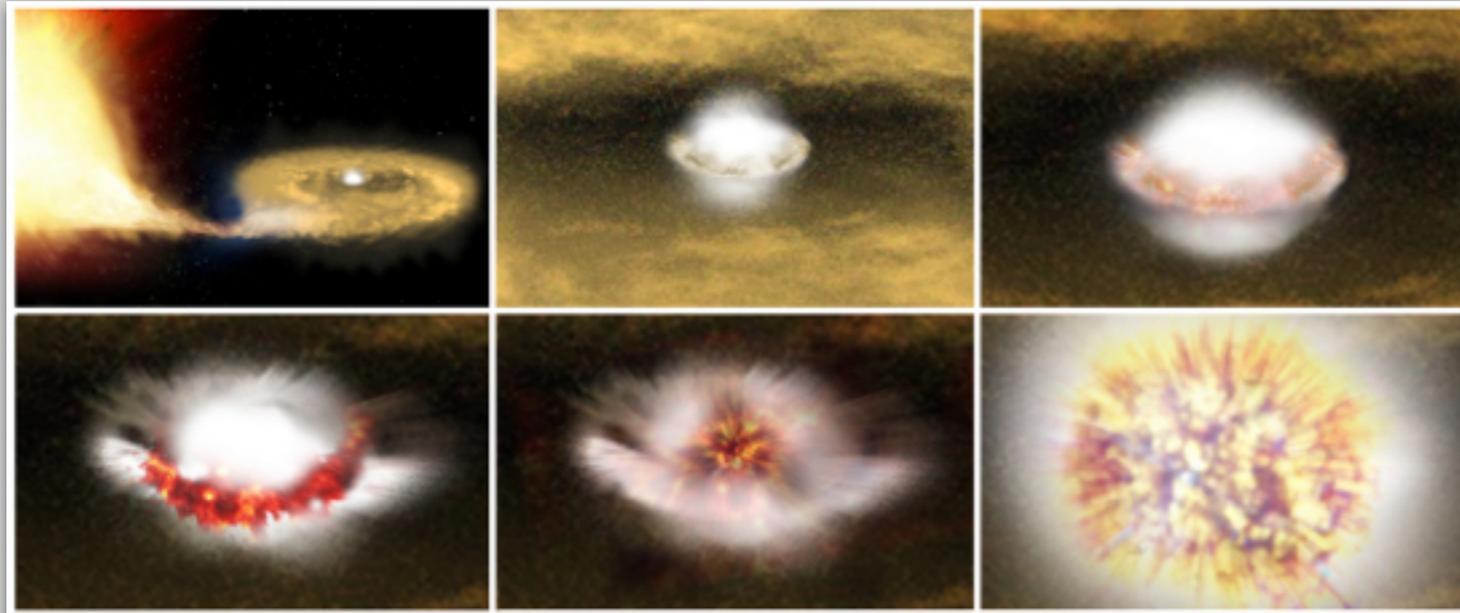
NASA Press Release 7/22/2014



Fermi studies of TGFs show that they can be produced by thunder storms having a wide range of intensity.

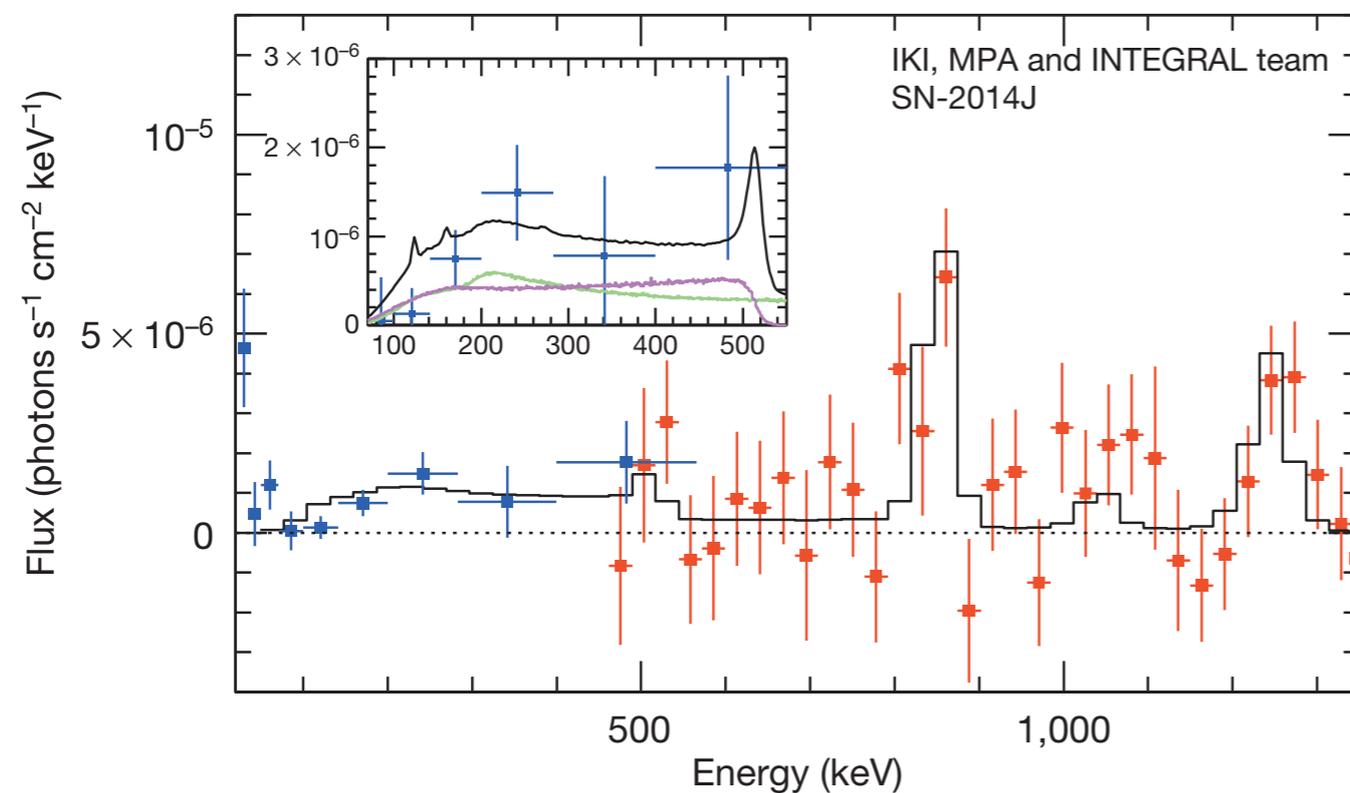
NASA Press Release 12/15/14

Recent INTEGRAL Highlight



Detection of ^{56}Co line emission (847/1256 keV) from Type Ia SN 2014J in M82.

(Churazov et al. 2014)



Related PCOS/GammaSIG Missions



RXTE

Dec, 1995 - Jan, 2012

ASM (2-12 keV)

PCA (2-60 keV)

HEXTE (15-250 keV)



Swift

launched Nov 20, 2004

mission extended thru FY 2016

XRT (0.3-10 keV)

BAT (15-150 keV)

Related PCOS/GammaSIG Missions



NuStar

launched Jun 13, 2012
mission extended thru FY 2016
3-79 keV



Suzaku

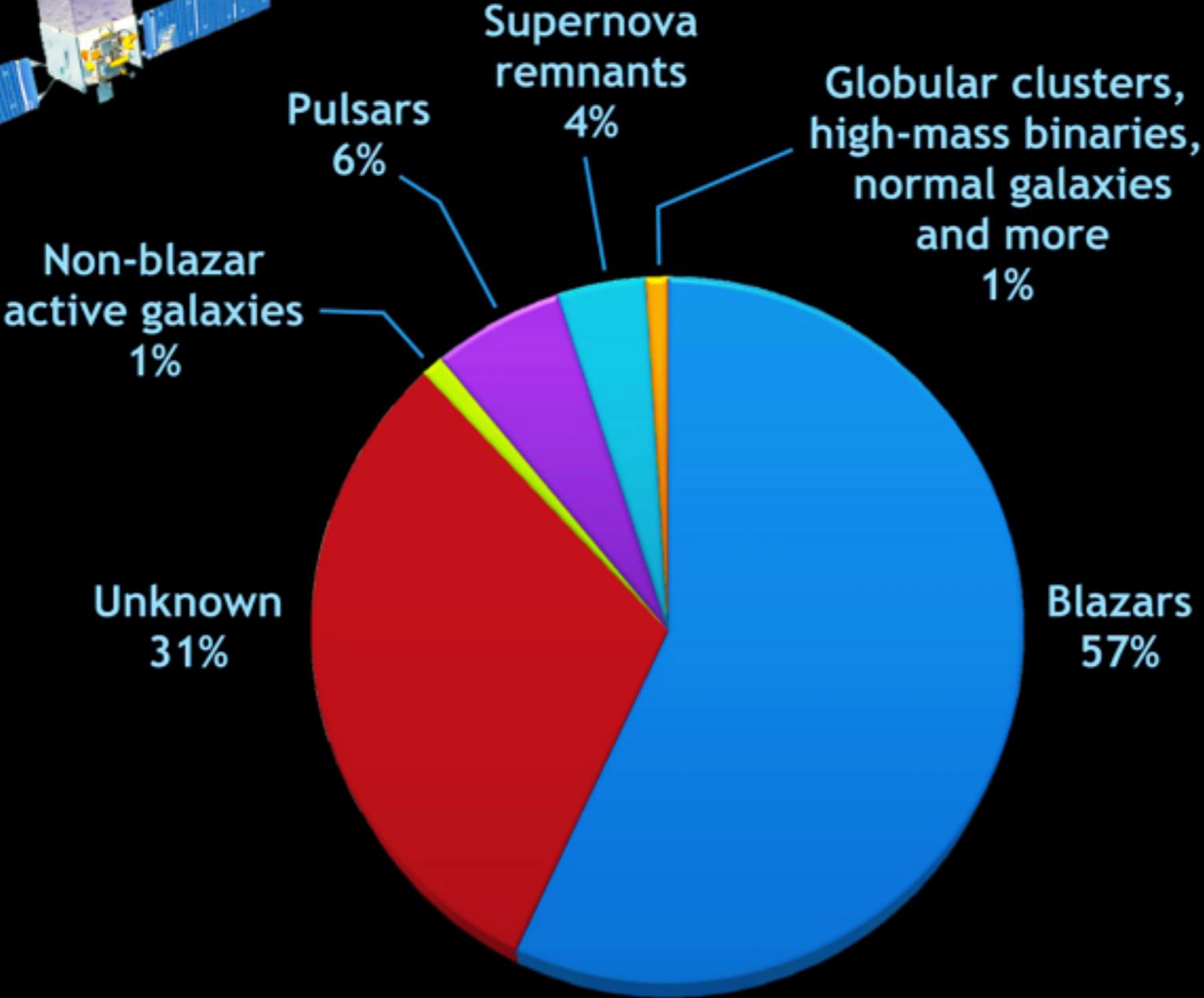
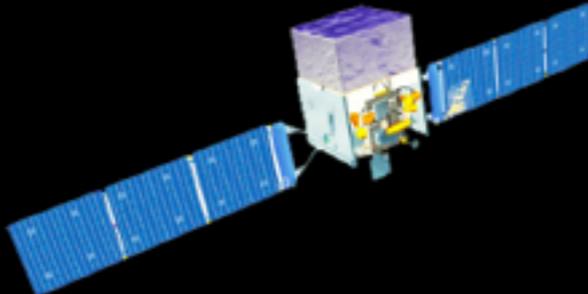
launched Jul 10, 2005
XSIS (0.2-12 keV)
HXD (10-600 keV)

What Next?

As we look beyond 2016, what is the future for space-based gamma-ray astronomy?

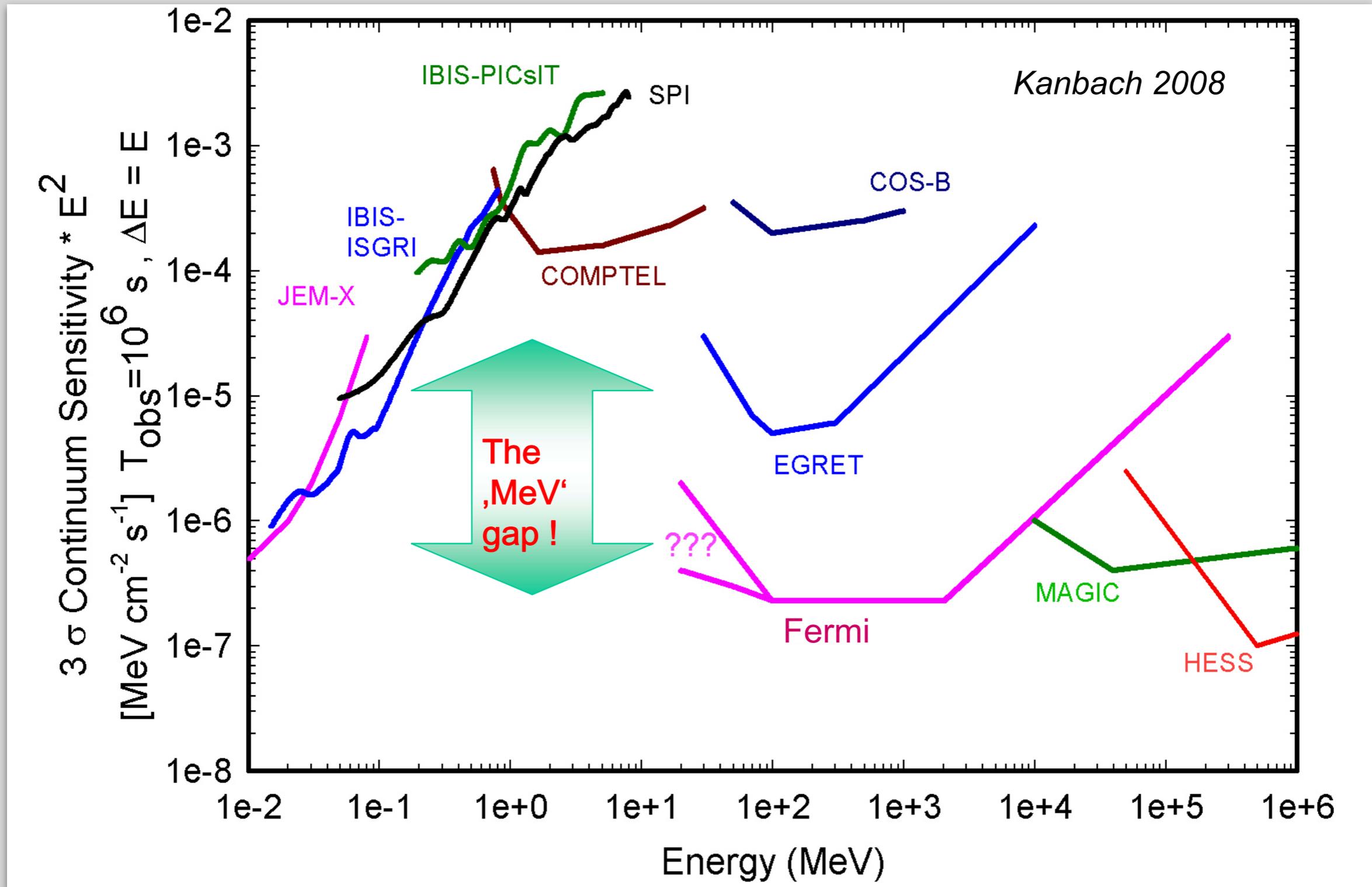
Remaining Mysteries

What has Fermi found: The LAT two-year catalog

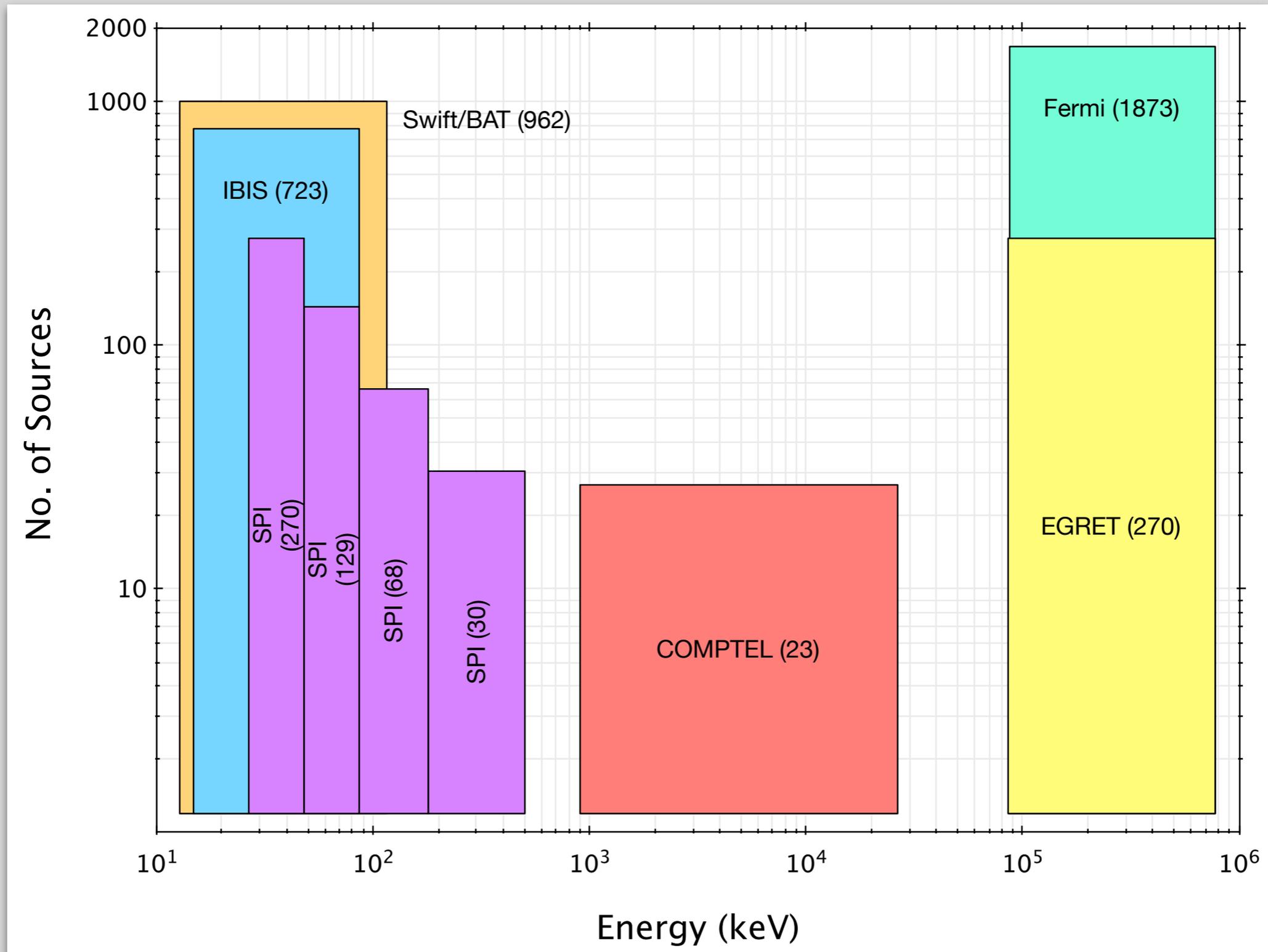


Credit: NASA/Goddard Space Flight Center

The "MeV Gap"

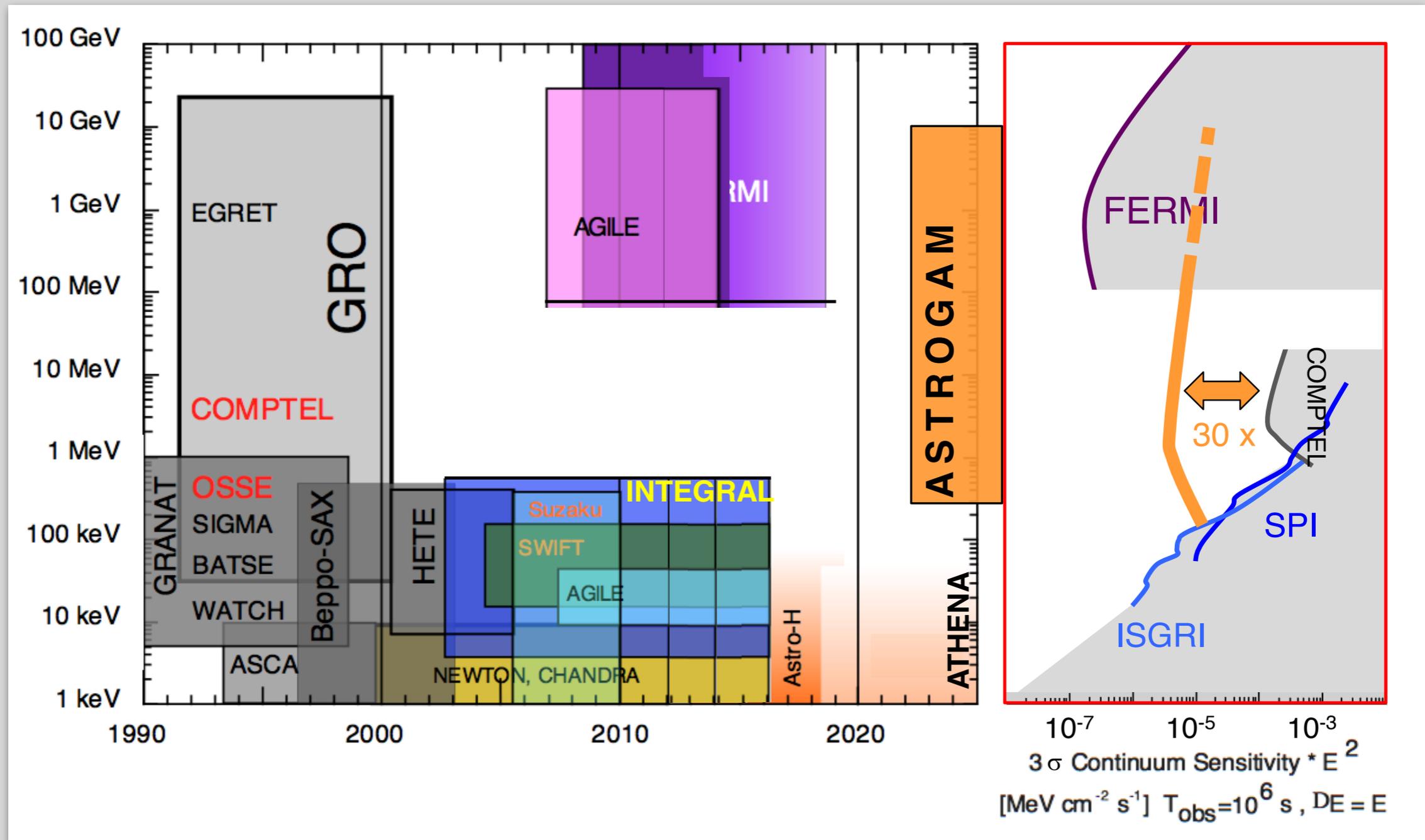


Source Counts vs Energy



M4 Proposal to Fill “MeV Gap”

Combined Compton/pair telescope to cover the range of 300 keV to 100 MeV.



Gamma Ray Science Interest Group

The goal for this year is to develop a community white paper to articulate a consensus for the future of space-based gamma ray astronomy.

GammaSIG Website

(<http://pcos.gsfc.nasa.gov/sags/gammasag.php>)

Mailing List

(<http://pcos.gsfc.nasa.gov/sags/gammasag/gammasag-maillist.php>)

Upcoming GammaSIG Events

Future Space-Based Gamma-Ray Observatories

Feb 5-7 workshop @ NASA/GSFC

Mini-Symposium on Future Gamma-Ray Missions

April APS Meeting @ Baltimore

PCOS Mini-Symposium

April APS Meeting @ Baltimore