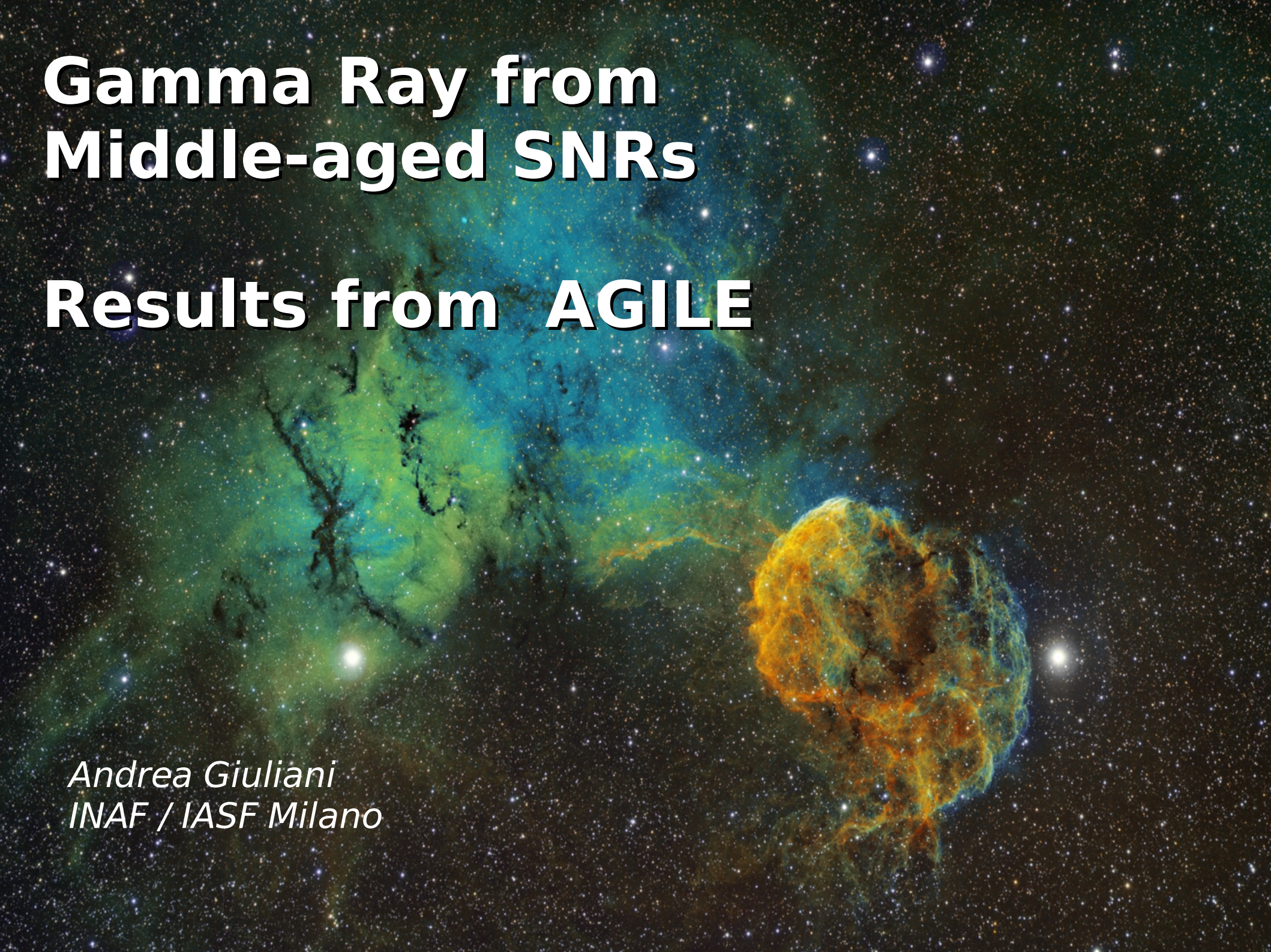


Gamma Ray from Middle-aged SNRs

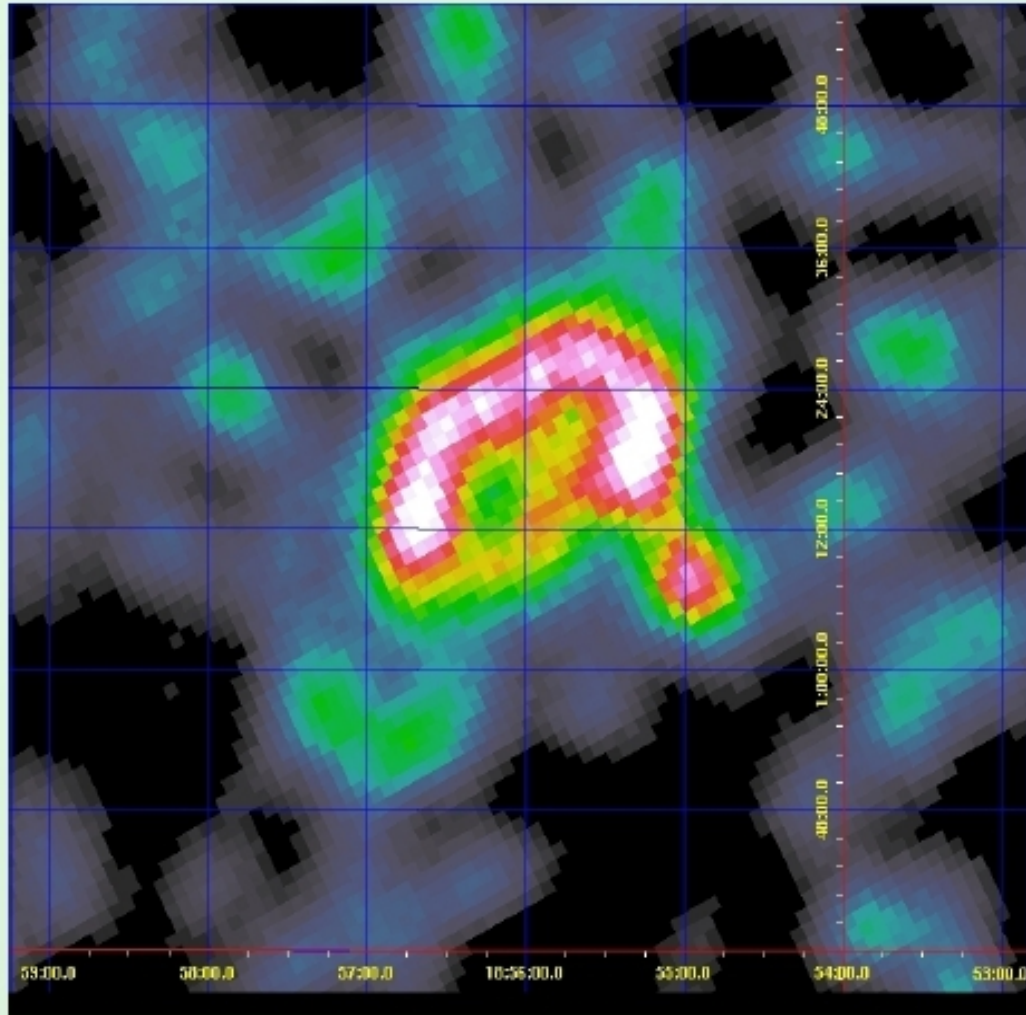
Results from AGILE

*Andrea Giuliani
INAF / IASF Milano*



SNR	AGE (yrs)	Distance (kpc)	G. Luminosity (erg/s)
W28	>35 000	1.8-3.3	3.3 10³⁴
IC 443	30 000	1.5	2.4 10³⁴
W44	20 000	3.0	6.5 10³⁴
W51	20 000	6.0 ?	7.3 10³⁴
Gamma Cyg.	5 000	1.0	6.0 10³³
RX J1713.7	1 500	1.2	~ 3.0 10³³

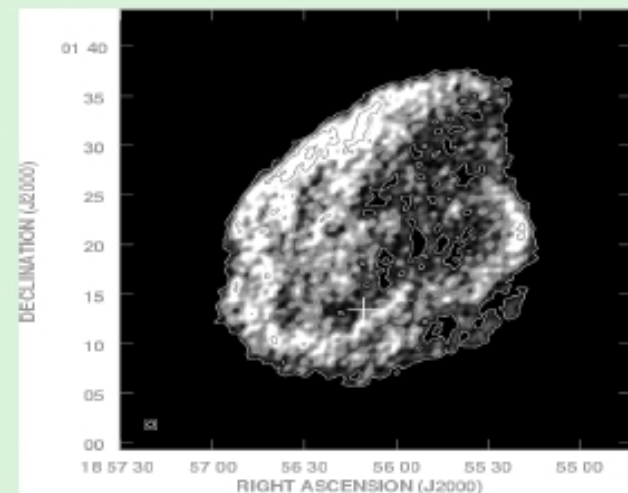
SNR W44



SNR W44 as seen by AGILE for energies greater than 400 MeV

AGILE detects SNR W44 with a significance of 15.8 sigma, as an extended source with a morphology well correlated with the radio shell seen at 74 Mhz .

The measured flux above 400 MeV is $16.0 \pm 1.2 \cdot 10^{-8} \text{ ph cm}^{-2} \text{ s}^{-1}$

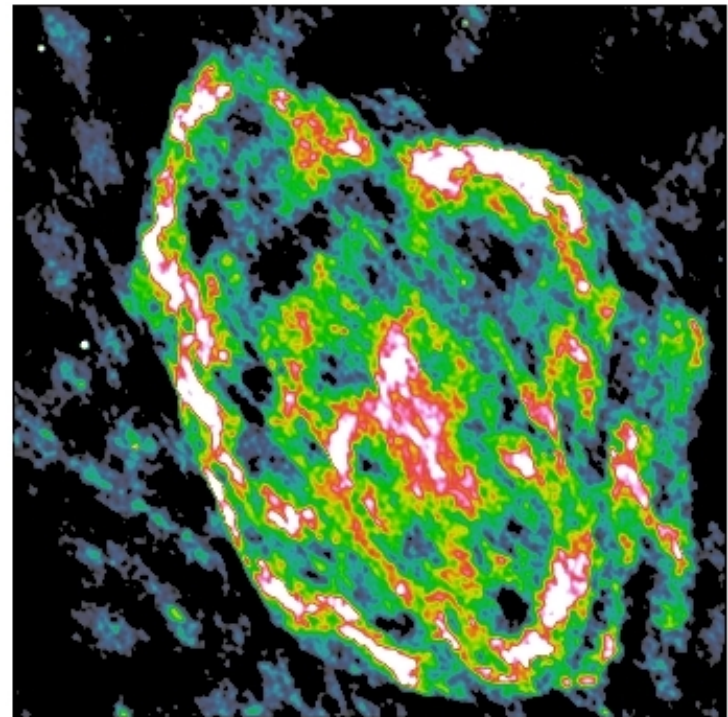
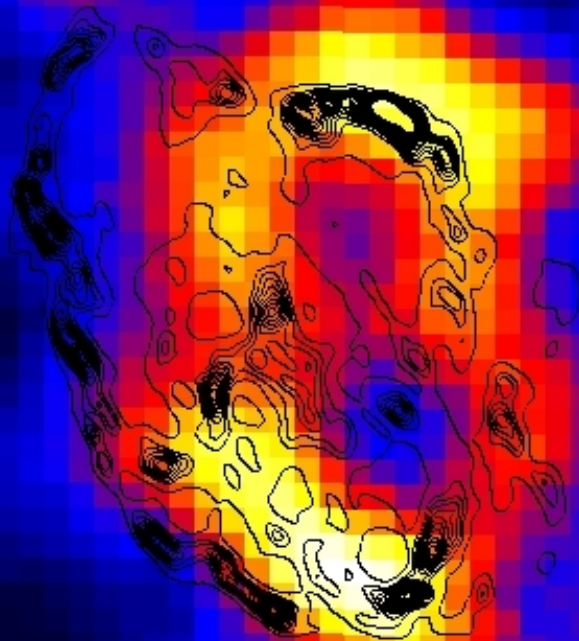


VLA map of W44 at 74 Mhz (from Castelletti et al. 2007)

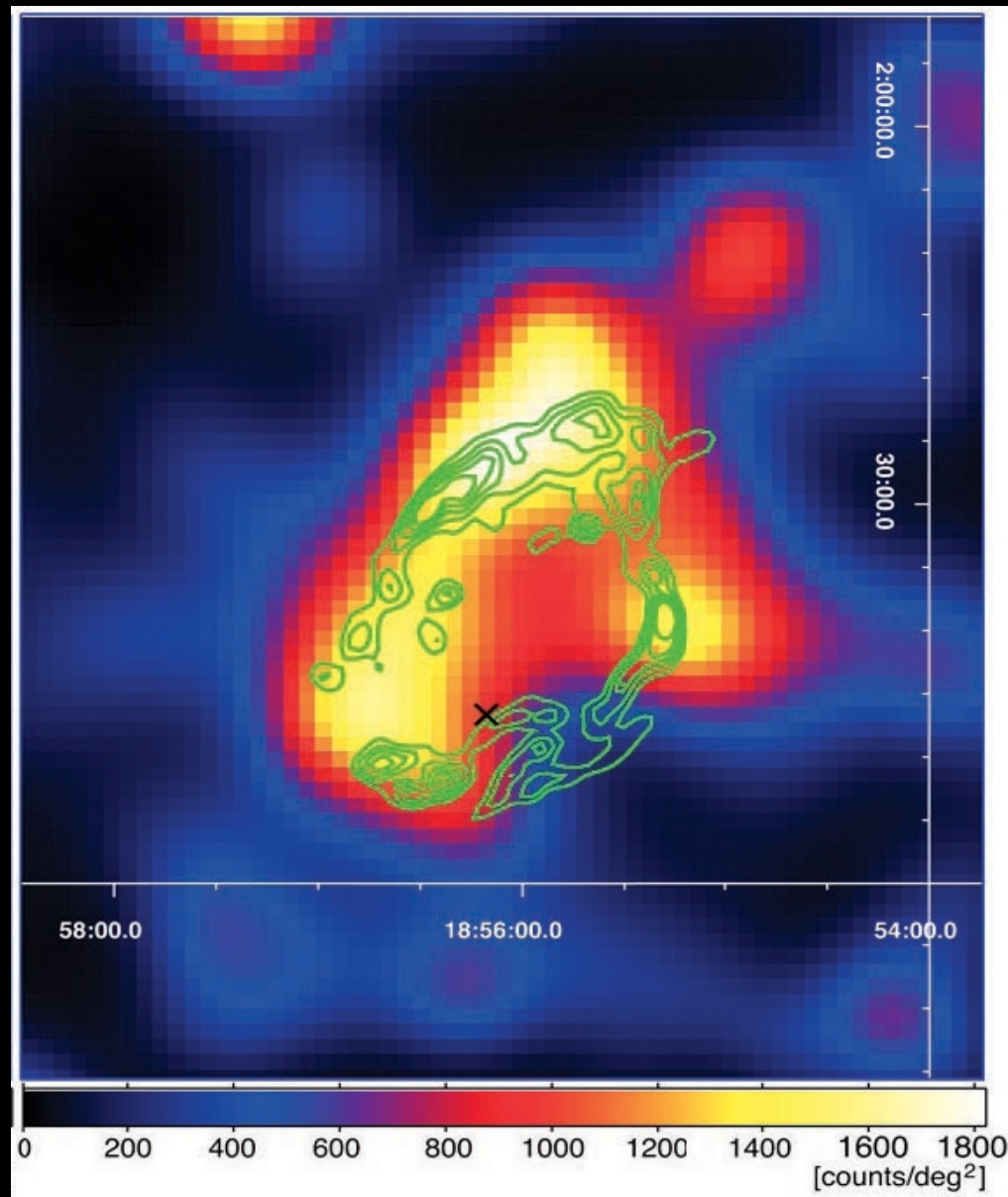
AGILE detection of W44

$E > 400 \text{ MeV}$

1.4 Ghz



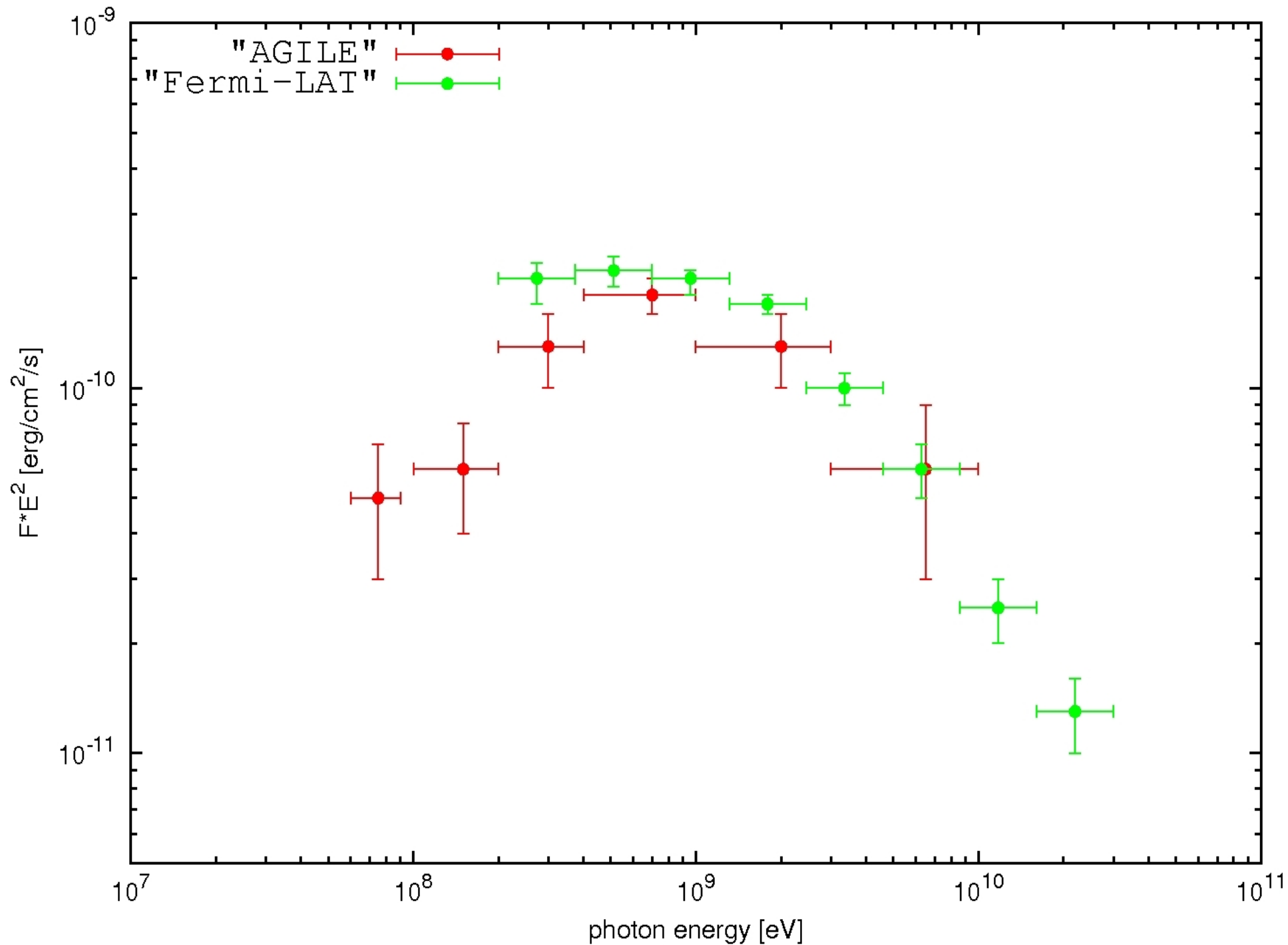
Fermi detection of W44



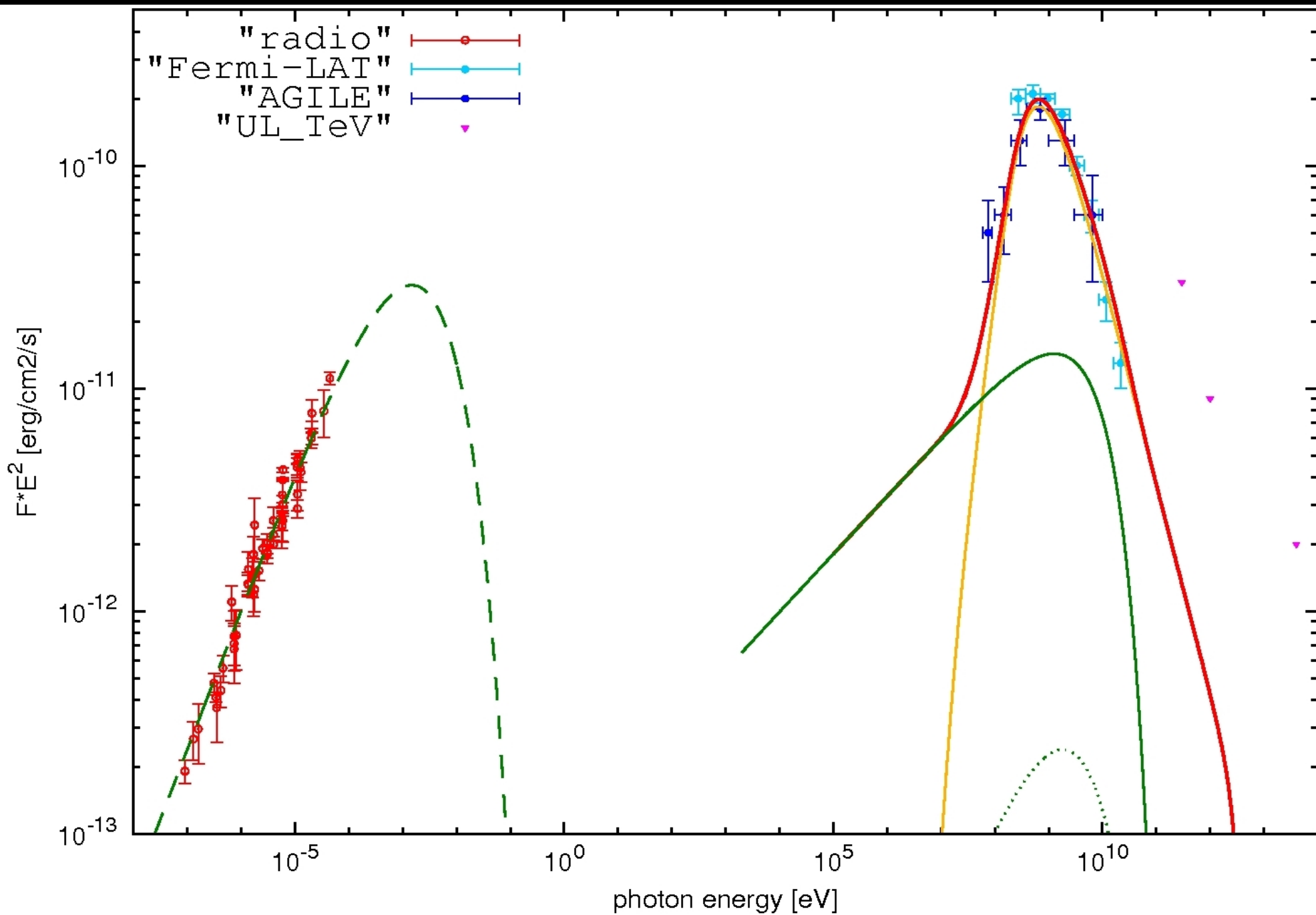
$E > 2 \text{ GeV}$

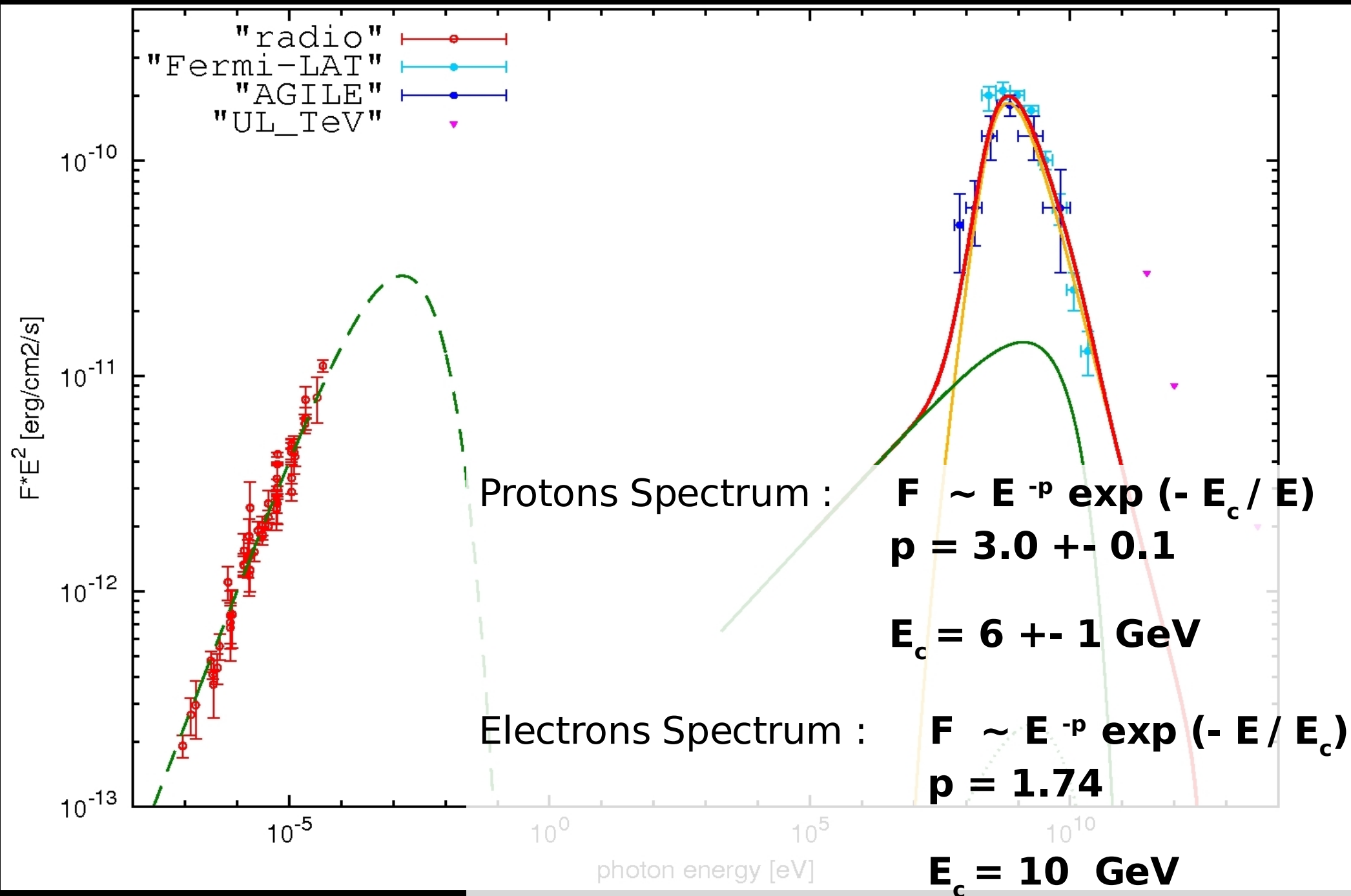
Abdo et al. Science 2009

Gamma-ray spectrum of SNR W44



SED for SNR W44





AGILE

$400 \text{ MeV} < E < 3 \text{ GeV}$

Red : soft sp.

Blue : hard sp.

Fermi

$400 \text{ MeV} < E < 3 \text{ GeV}$

