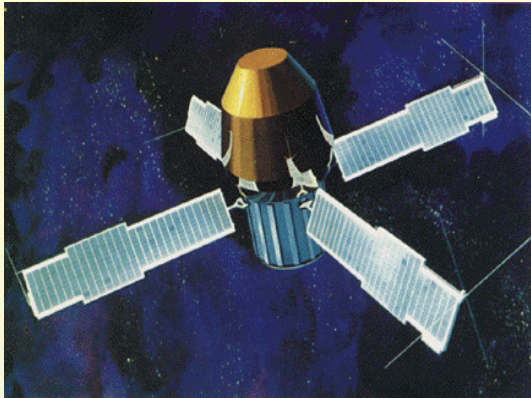


A Multiλλλ Strategy

for Identifying
 γ -ray Sources

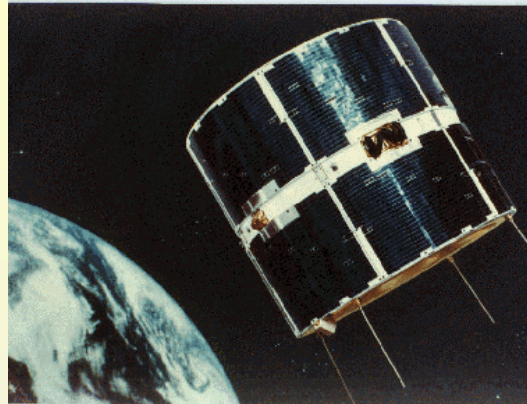
Patrizia Caraveo

SAS-2



8,000 γ
3 sources

COS-B



158,000 γ
25 sources

EGRET

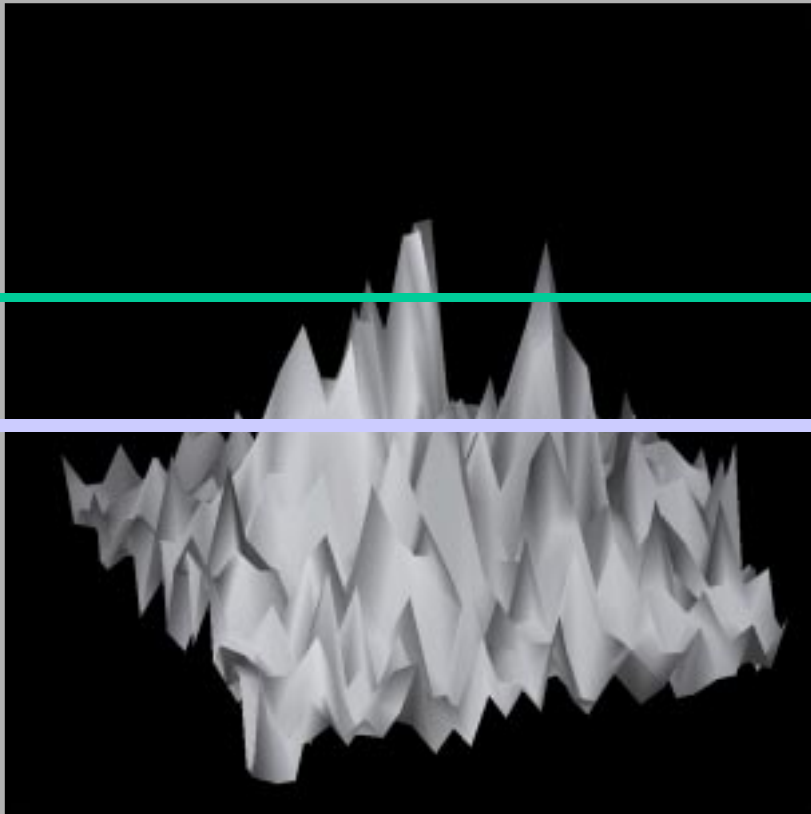


900,000 γ
271 sources

More γ s mean more sources

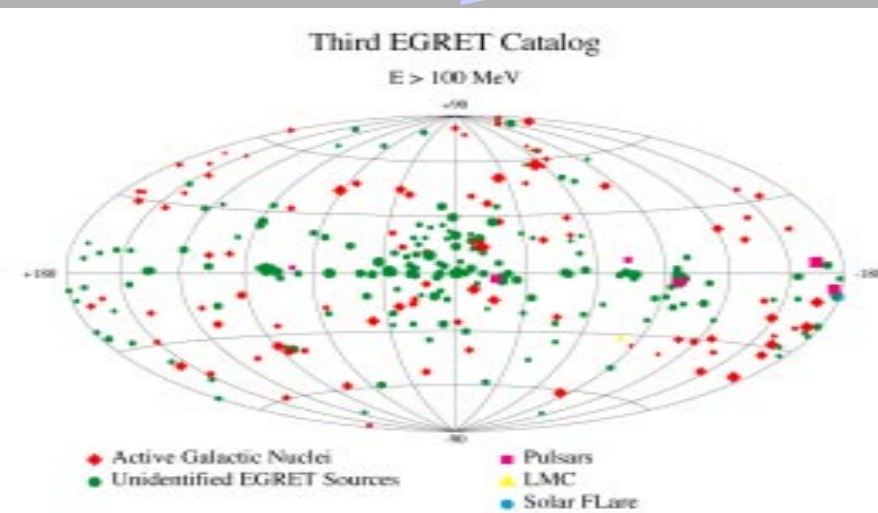
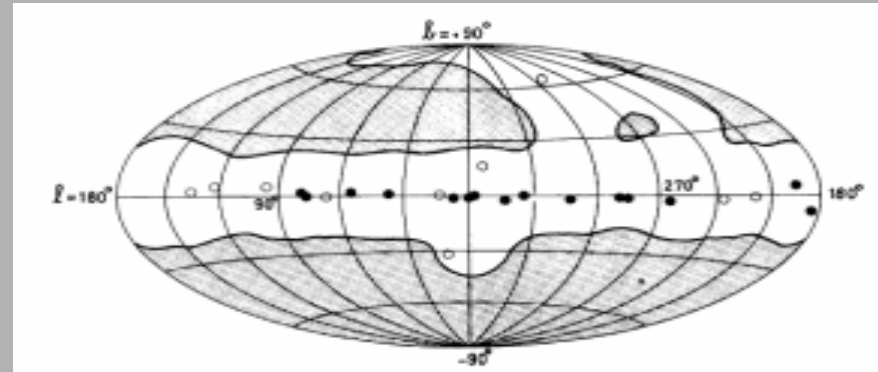
From COS-B to EGRET

Tip(s) of the iceberg(s)



Cos-B

Egret



From COS-B to EGRET

22 sources with $b < 10^\circ$

2 pulsars

20 UGOs

80 sources with $b < 10^\circ$

5(8) pulsars + Geminga

74 UGOs [1 solar flare]

90%

GLOBAL UGOs' characteristics are unchanged

3 sources with $b > 10^\circ$

3C273

ρ Oph

1 weak unid. source

181 sources with $b > 10^\circ$

66 AGNs (VARIABLE)

28 probable AGNs

LMC, Cen A

96 unid. sources

50%

The majority of the sources are unidentified

Few, isolated cases have been solved

Geminga	73-93	INS
2CG 342-02	PSR1706-49	INS

Few are being solved

3 EGJ1835+5918	radio quiet	INS
2 CG 135+01	GT 61.303	
3 EGJ2020+4017	γ Cyg. SNR	
3 EGJ1420-6038,	pulsar nebulae	
3 EGJ0634+0521	msec pul +Be	

Few more pulsars ...for sure

**The rate of Identification is very low
1source/10y. It will take centuries to finish**

No general solution

**Euler was in the same position
vis-à-vis the Fermat theorem**

**He was unable to find a general
solution, special cases were not satisfactory
and said “without a bright idea ...”**



It took 300 y to get a bright idea

Do we have bright ideas ??

More of the same : Multi $\lambda\lambda\lambda$ astronomy

from γ to radio

from radio to γ

**success rate: very high
...very low**

just pulsars

from γ to X-rays

from X-ray to optical

From γ to X-rays

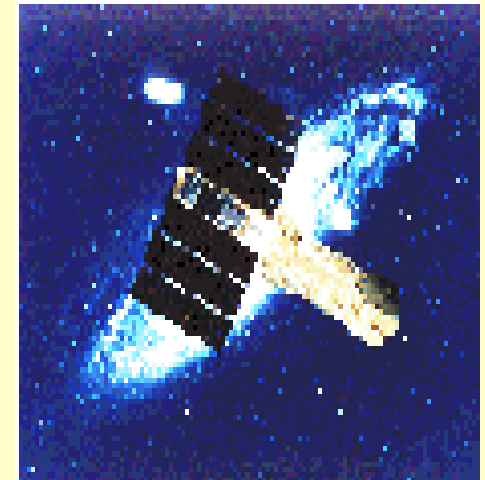
Nothing really new

use whatever is available

whatever grants time to exploratory programs
with **no a priori knowledge of the findings**



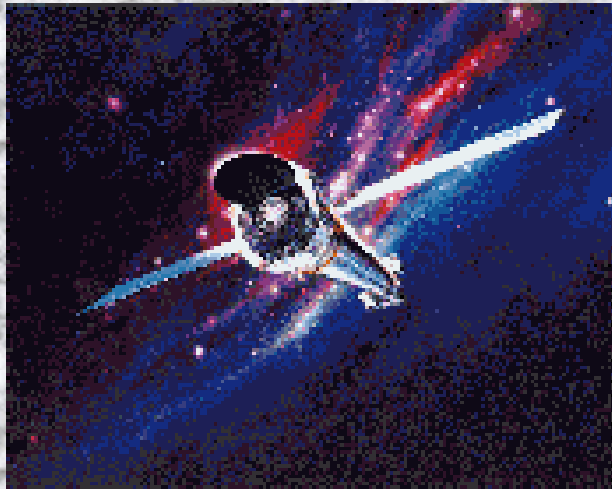
1980'



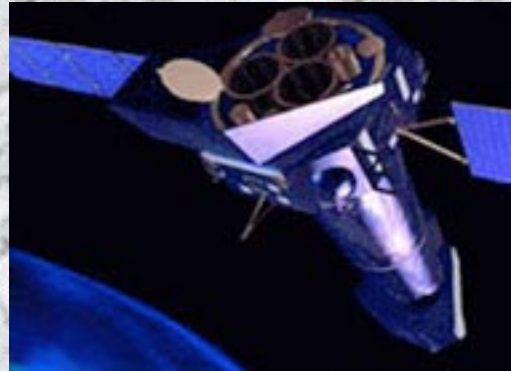
1990'

2000 ...

Chandra



Newton



Both have programmes dedicated to the study of few EGRET sources

Data are being collected

How many sources will be found ?

**EPIC will detect 40-100 sources
for each EGRET**



mainly AGNs and stars

Massive approach to optical ID

From X-rays to optical

ESO WFI (at the 2.2)

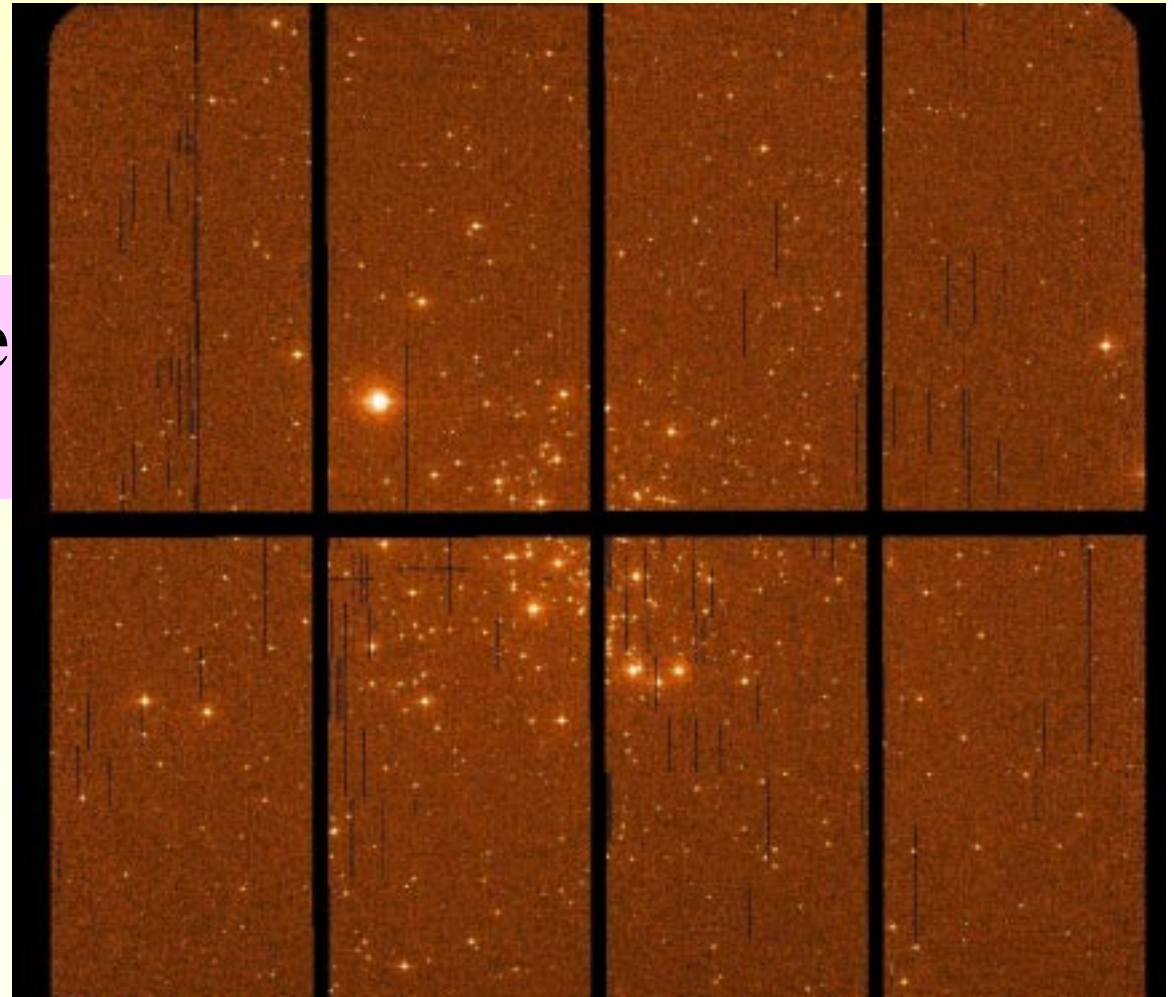
30'x30'

mv 25 in 1 h

New perspective

Directly comparable
to an EPIC field

Almost
too big
to handle
142 Mb



From X-rays to optical

ESO WFI should speed up significantly
the optical side of the γ -X-opt chain

No need to wait for the X-ray source positions
to start the optical observations

Moreover, WFI is devoted to surveys



Possibility to x-correlate

X-ray and optical images

**using the colors to discriminate
candidates for further studies**

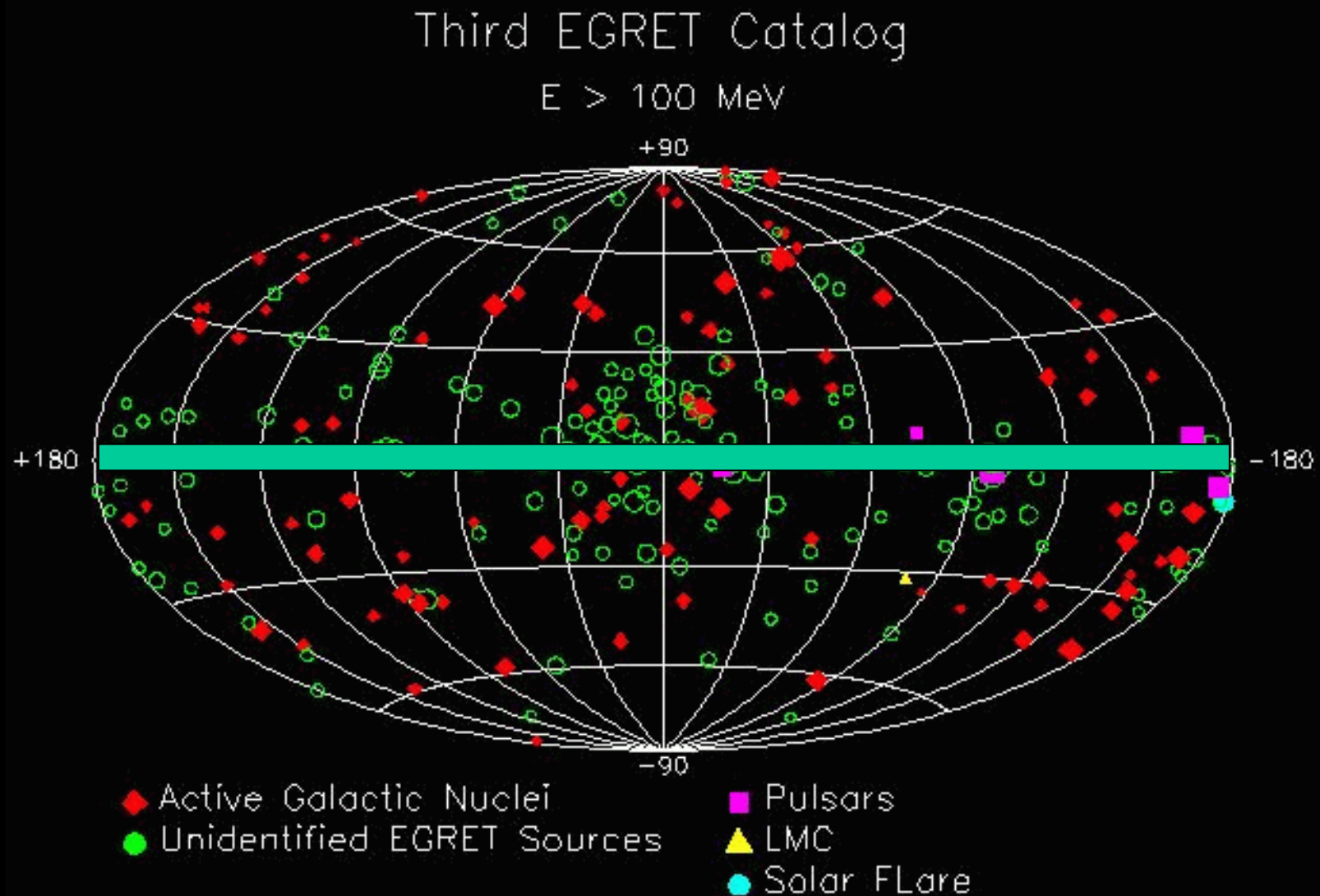
Discriminate WHAT ?

So far, we have in mind one template

Geminga-like sources

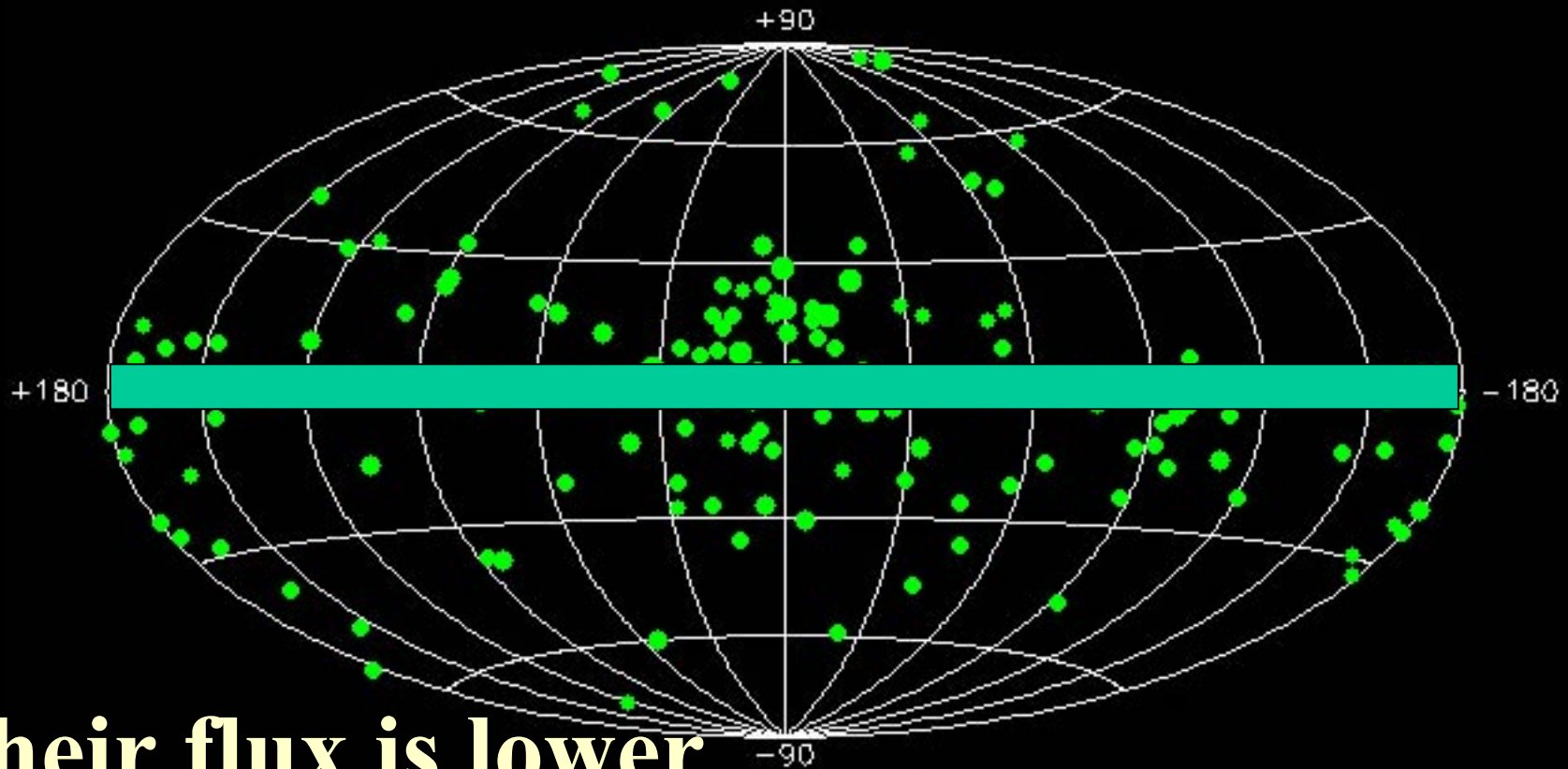
**However, we know that it cannot
apply to ALL UGOs**

Low latitude sources should be more luminous than Geminga



Mid latitude sources

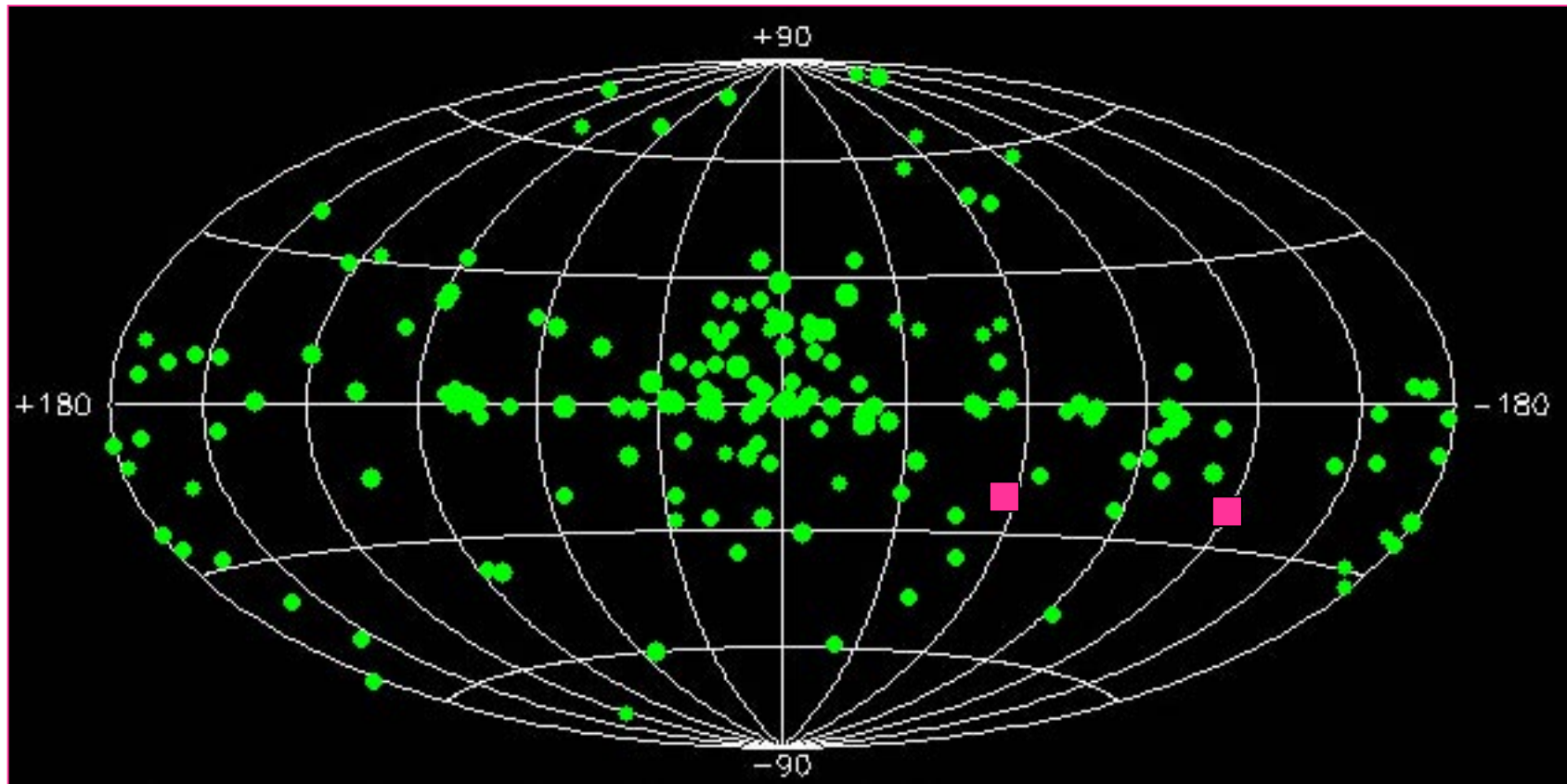
Are another first of EGRET



Their flux is lower

Their distance should be lower

Their luminosity should be lower



Mid latitude sources are the targets of our Newton exploration

Low latitude sources

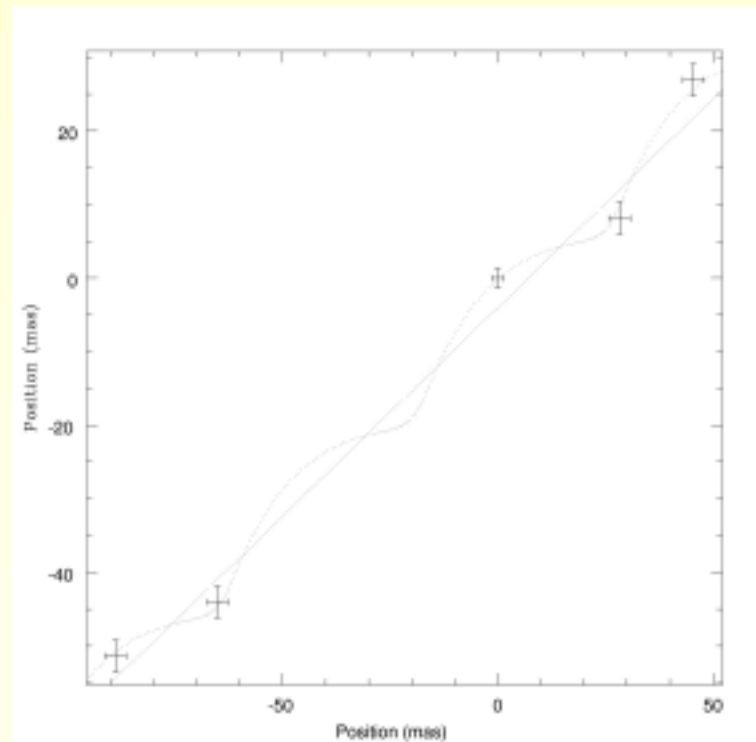
What can they be ?

Pulsars ?

Young ? Unseen?

For sure **BRIGHT** $\langle L_{\gamma} \rangle 10^{35} - 10^{36}$

Crab	4	10^{34}
Vela	1.7	10^{34}
1706	2.6	10^{34}
Geminga	2	10^{33}
1055	9	10^{33}
1951	1.4	10^{34}



Conclusions

Need for a template

radio at low frequency ?

WFI will help

Need for bright ideas

observation

theory