

La conquista dell'invisibile

Patrizia Caraveo



Messaggeri visibili e invisibili

- I fotoni - telescopi a terra e nello spazio

L'astronomia è una macchina del tempo



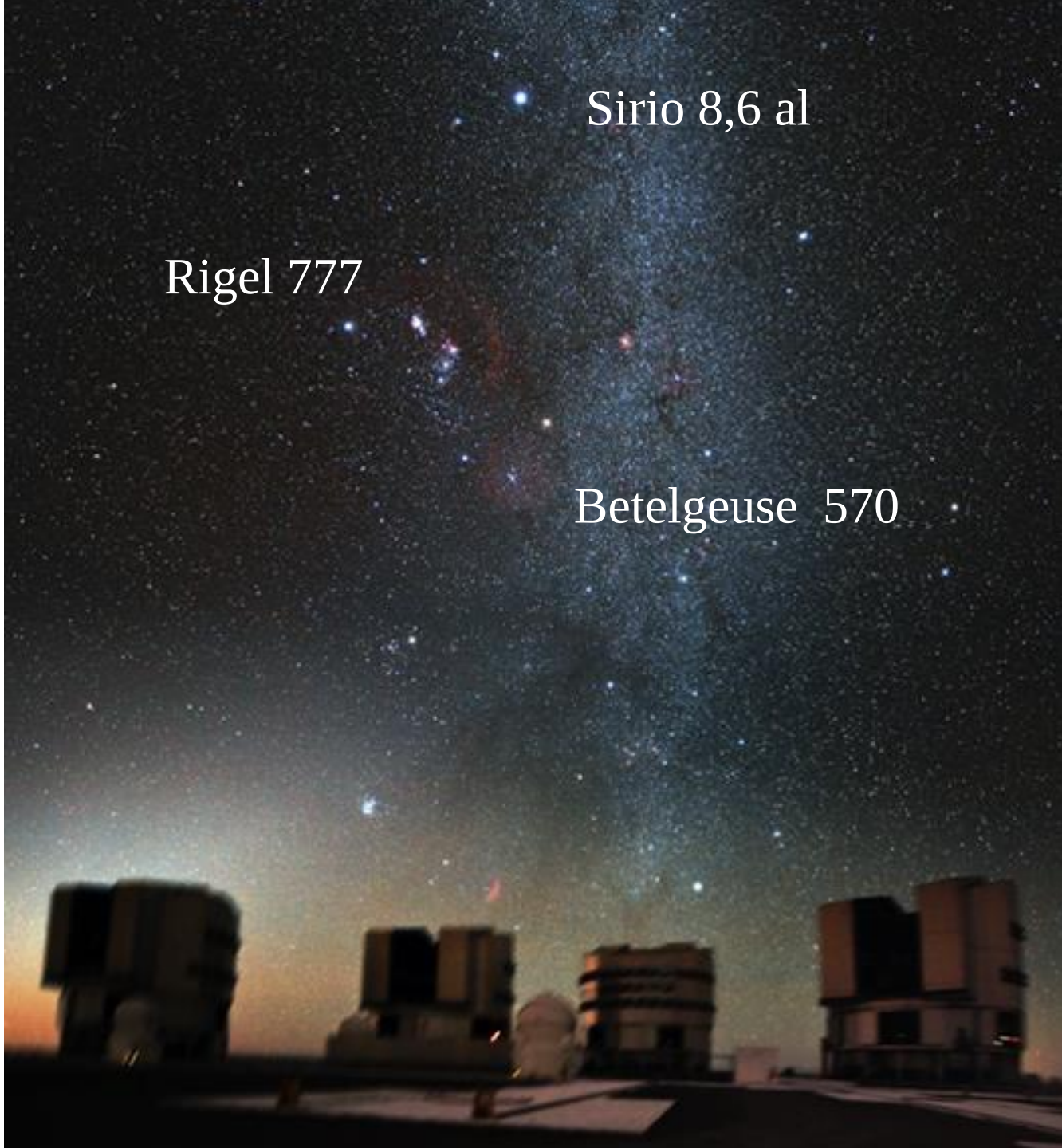




Sirio 8,6 al

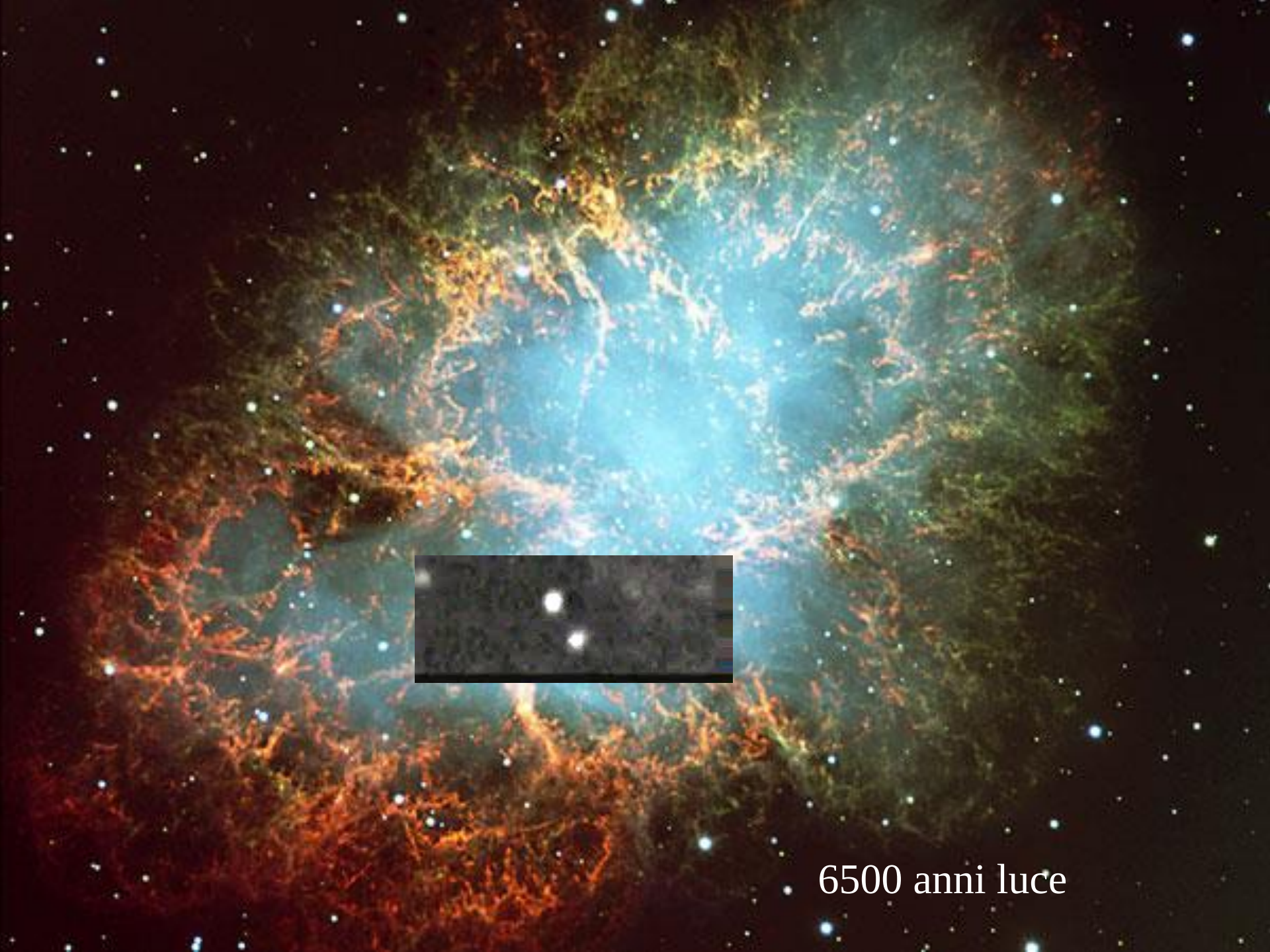
Rigel 777

Betelgeuse 570





1300 anni luce



6500 anni luce



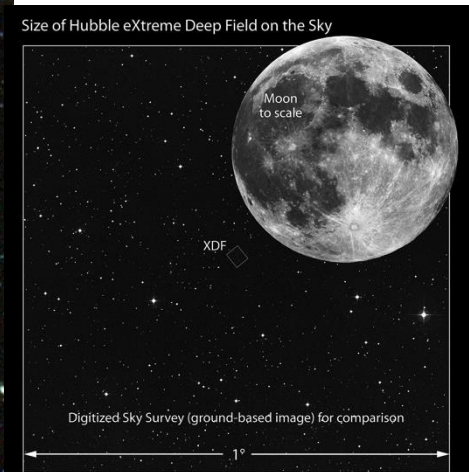
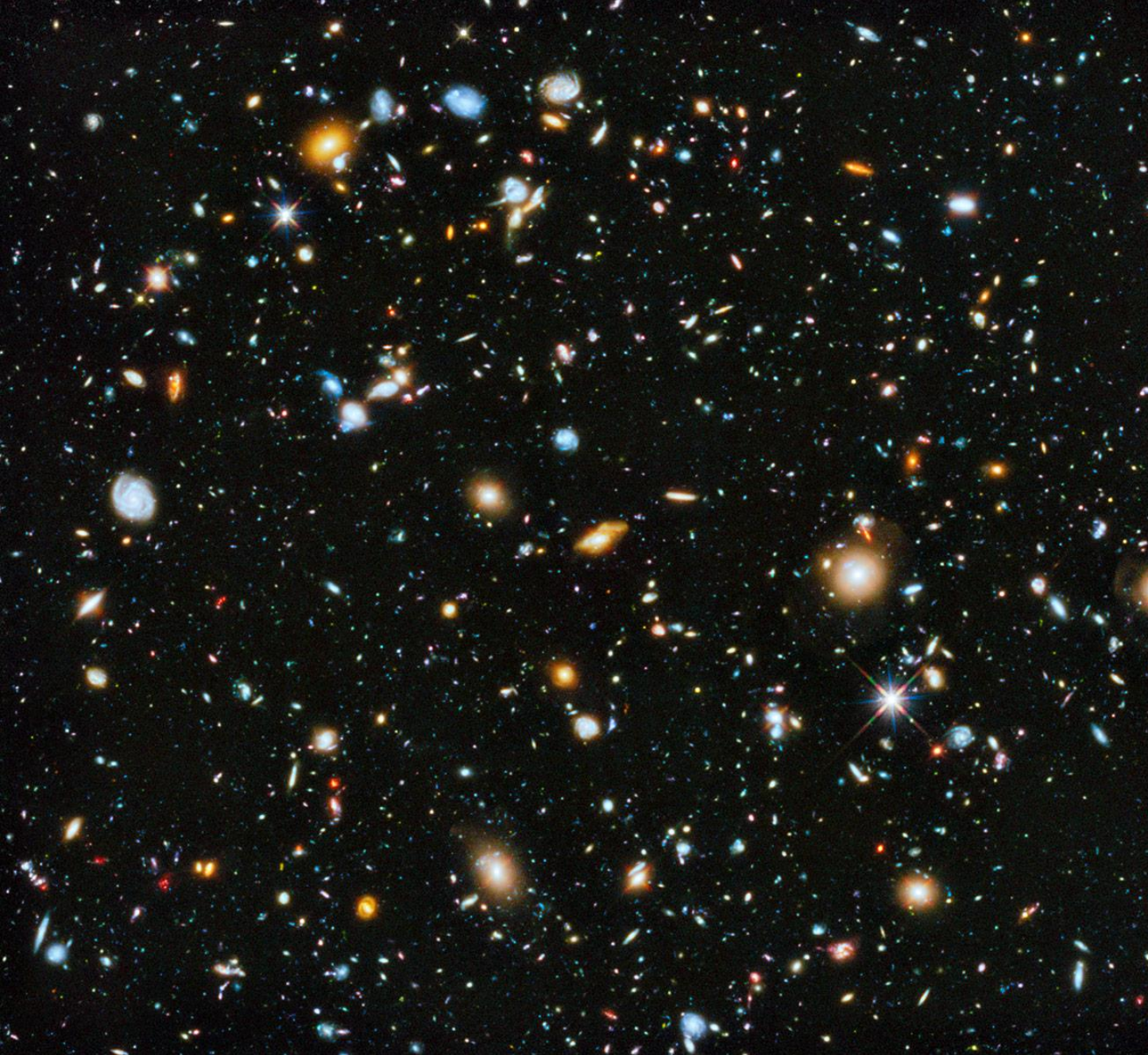
2,2 M anni luce

I dinosauri

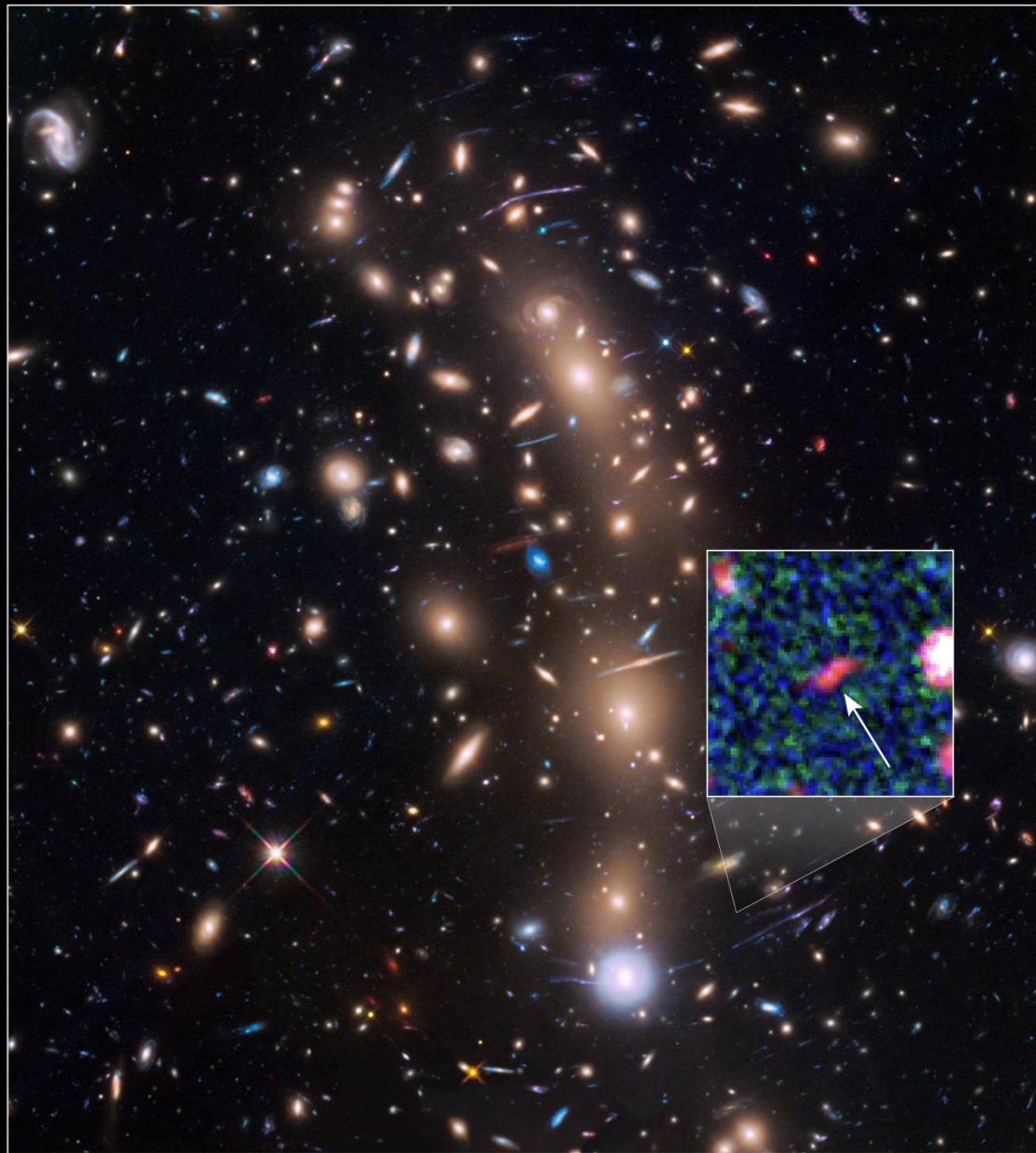


NGC 2770
Supernova factory

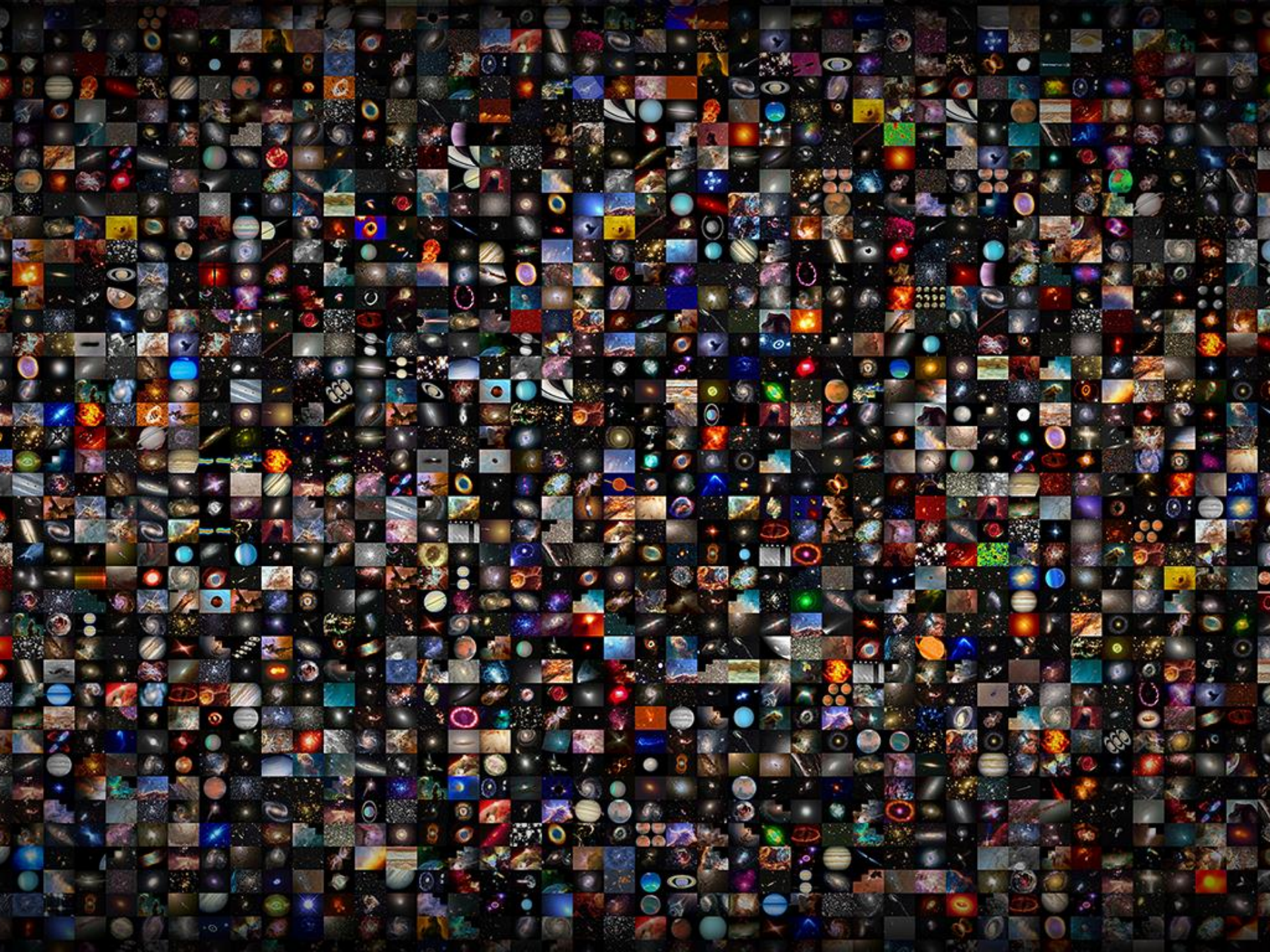
D=90 M a.l.

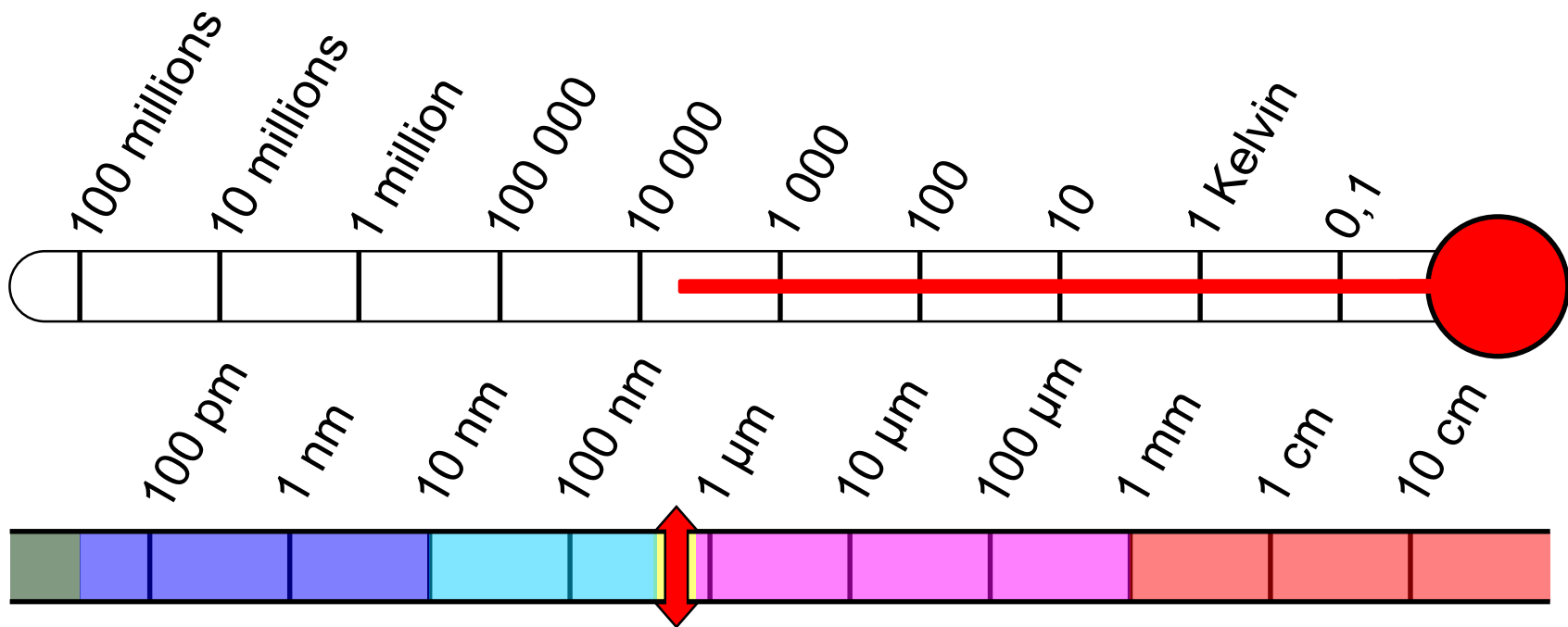


Hubble Ultra Deep Field 2014 - uv, Visible, and IR

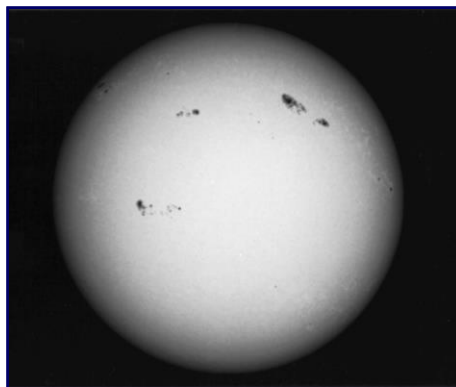


Faint Compact Galaxy in the Early Universe
Hubble Space Telescope ■ WFC3, ACS

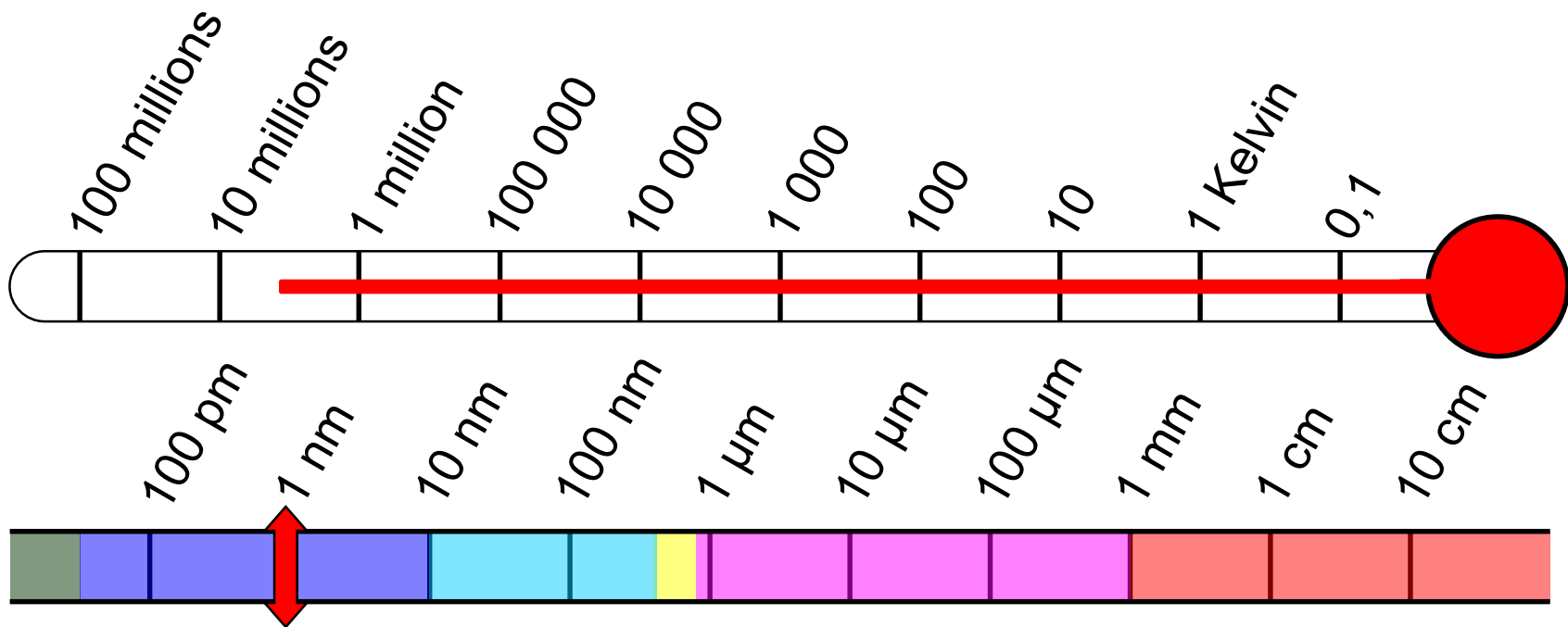




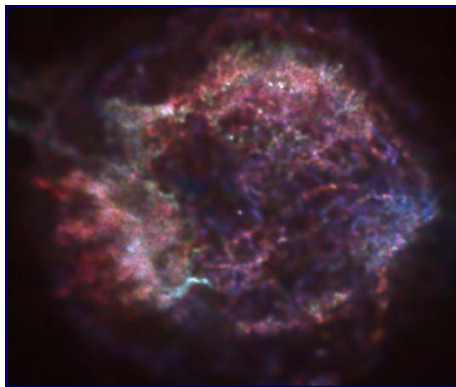
II VISIBILE



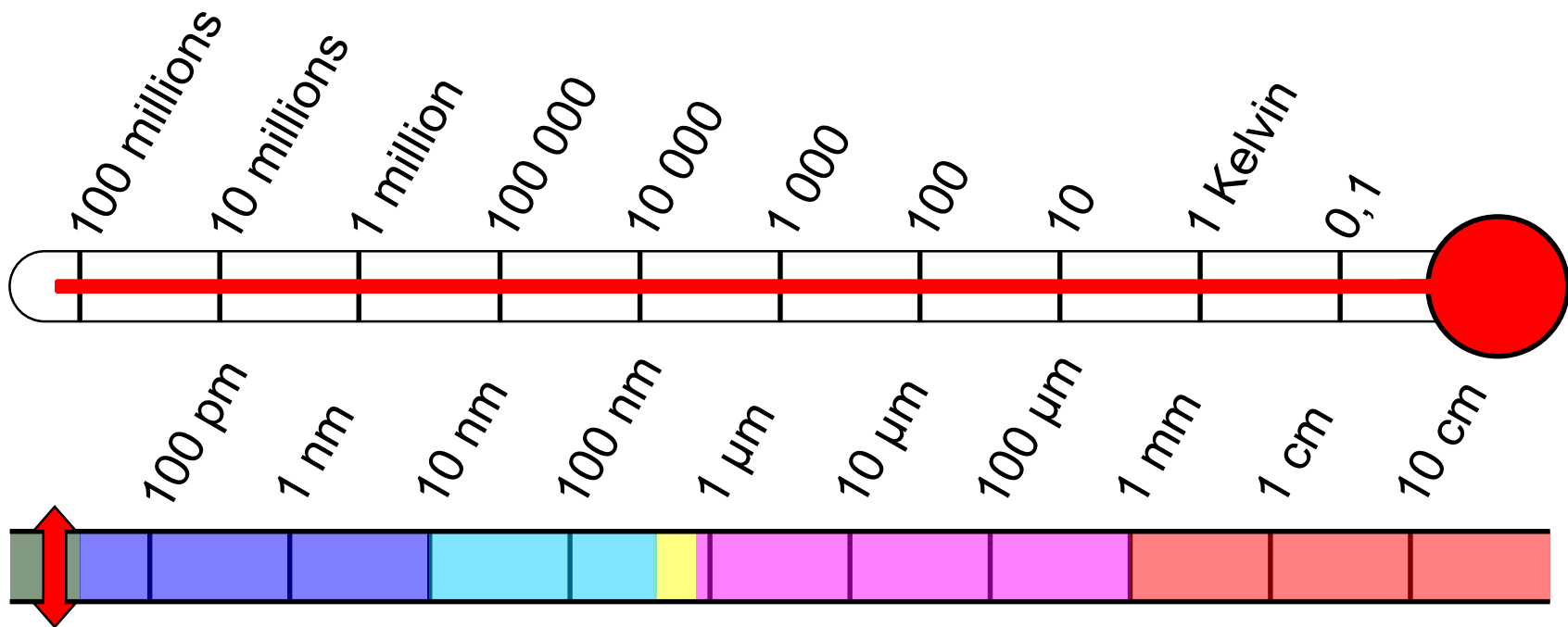
II SOLE



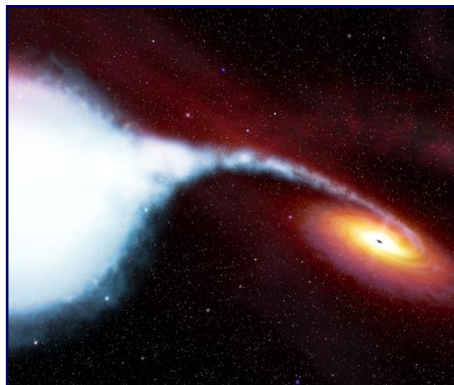
I RAGGI X



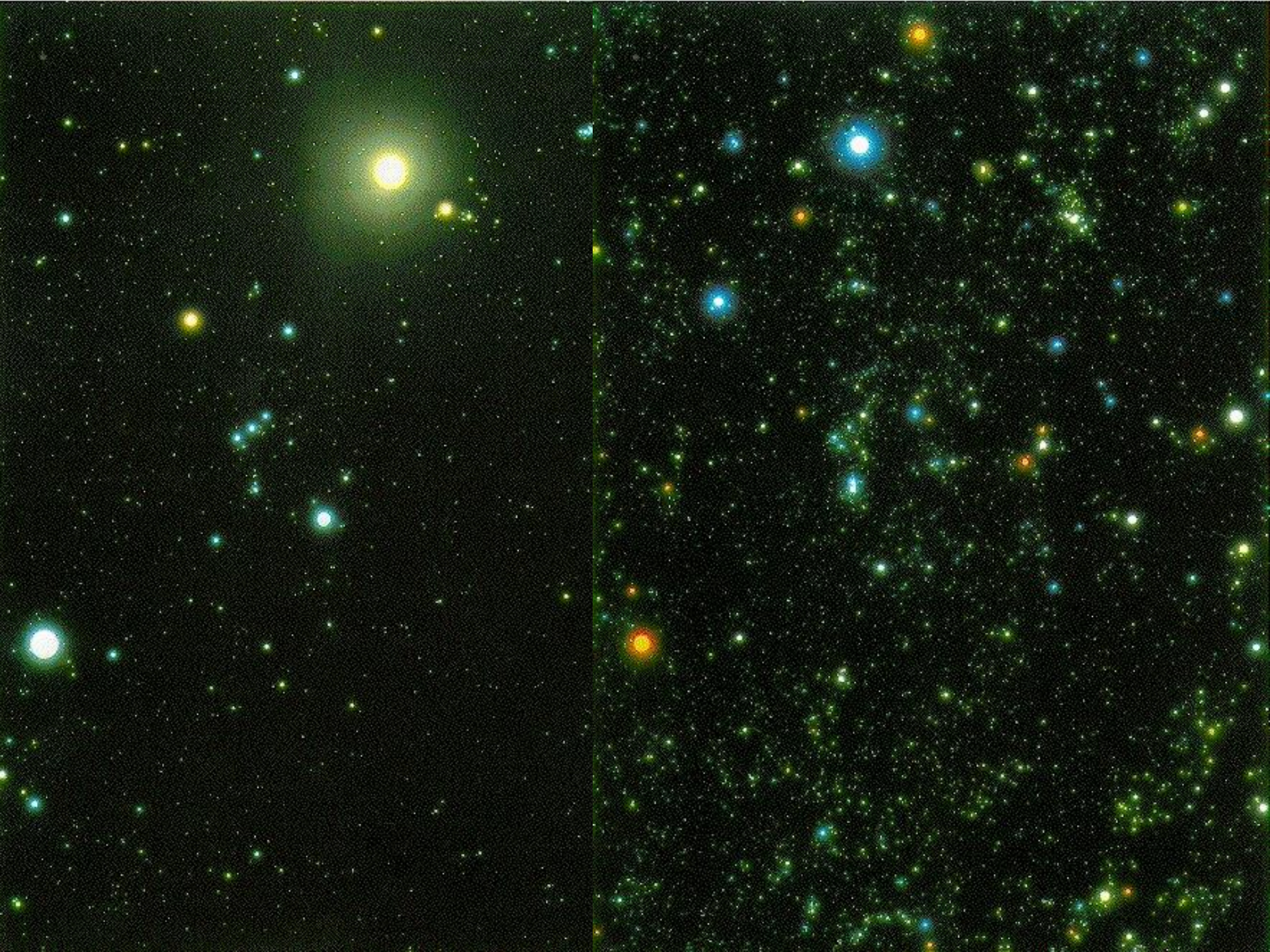
L'Universo
Caldo
Resti di
Supernova



I raggi γ



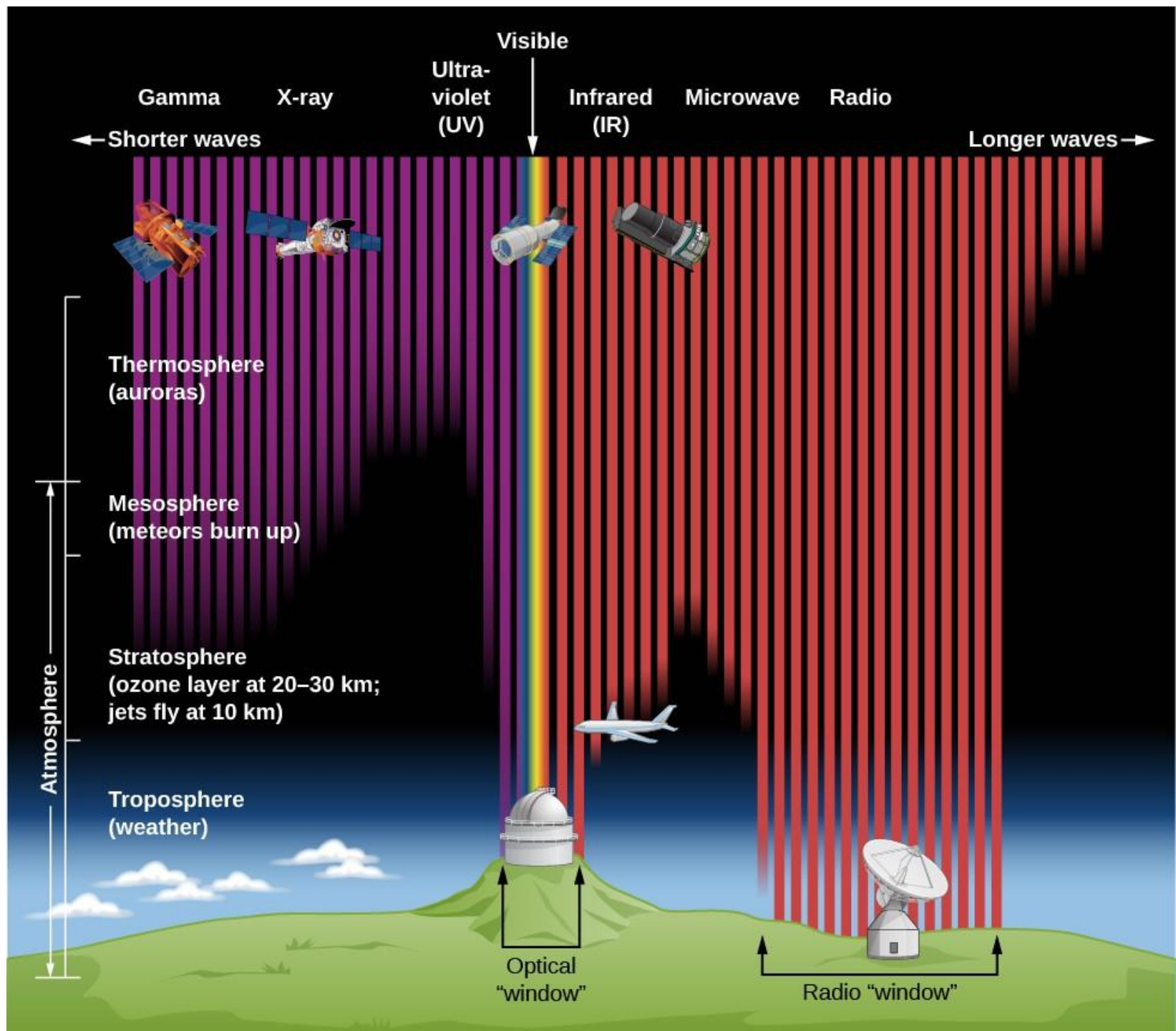
L'Universo
estremo
I buchi neri





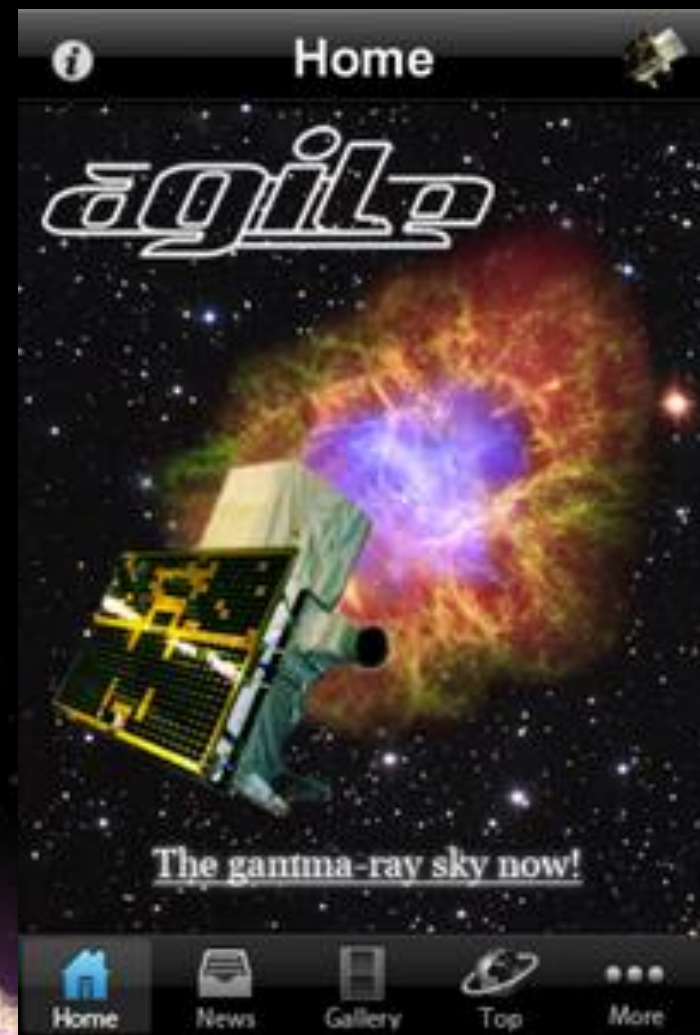
Visible



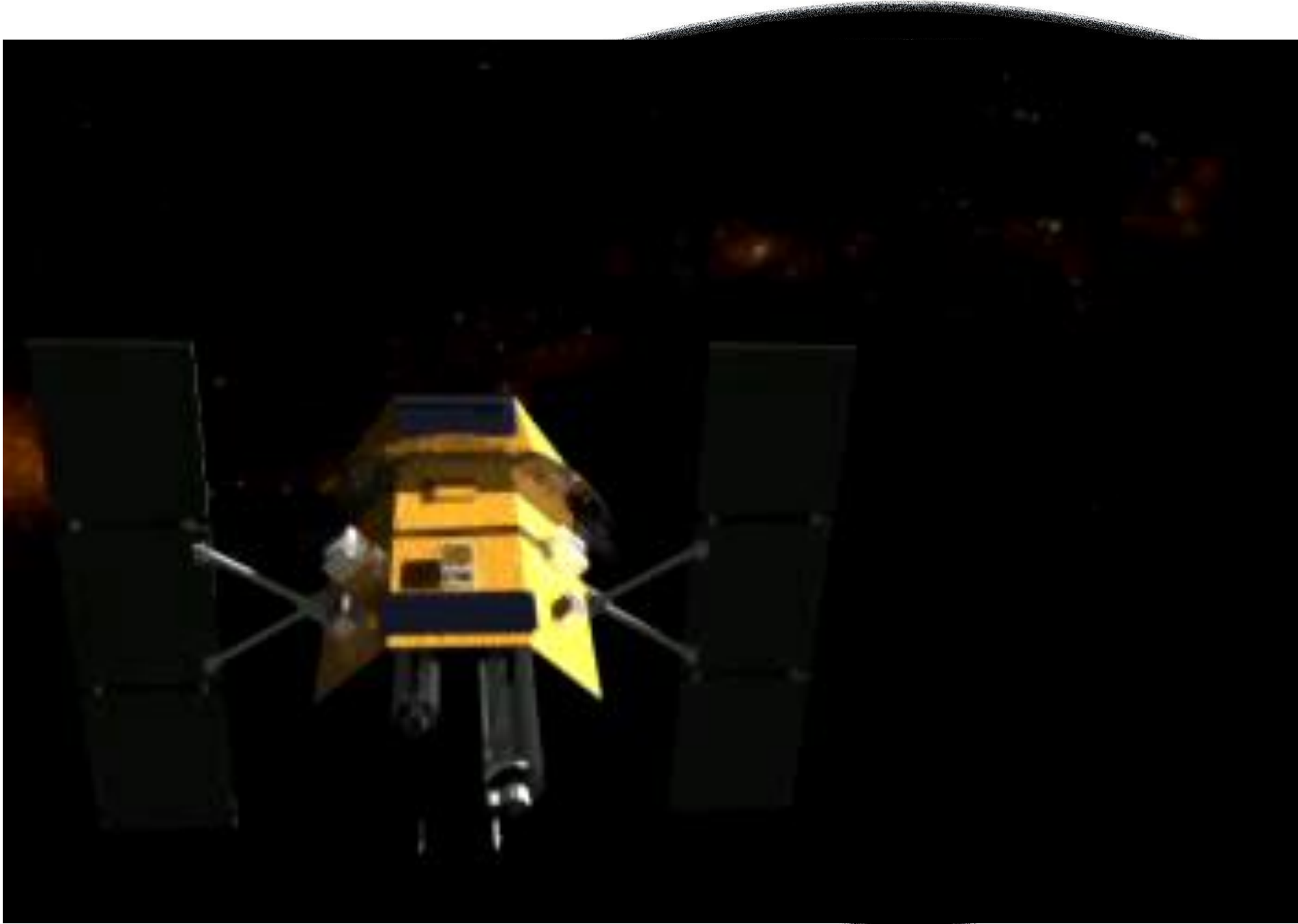




**Per essere
sempre
informati**

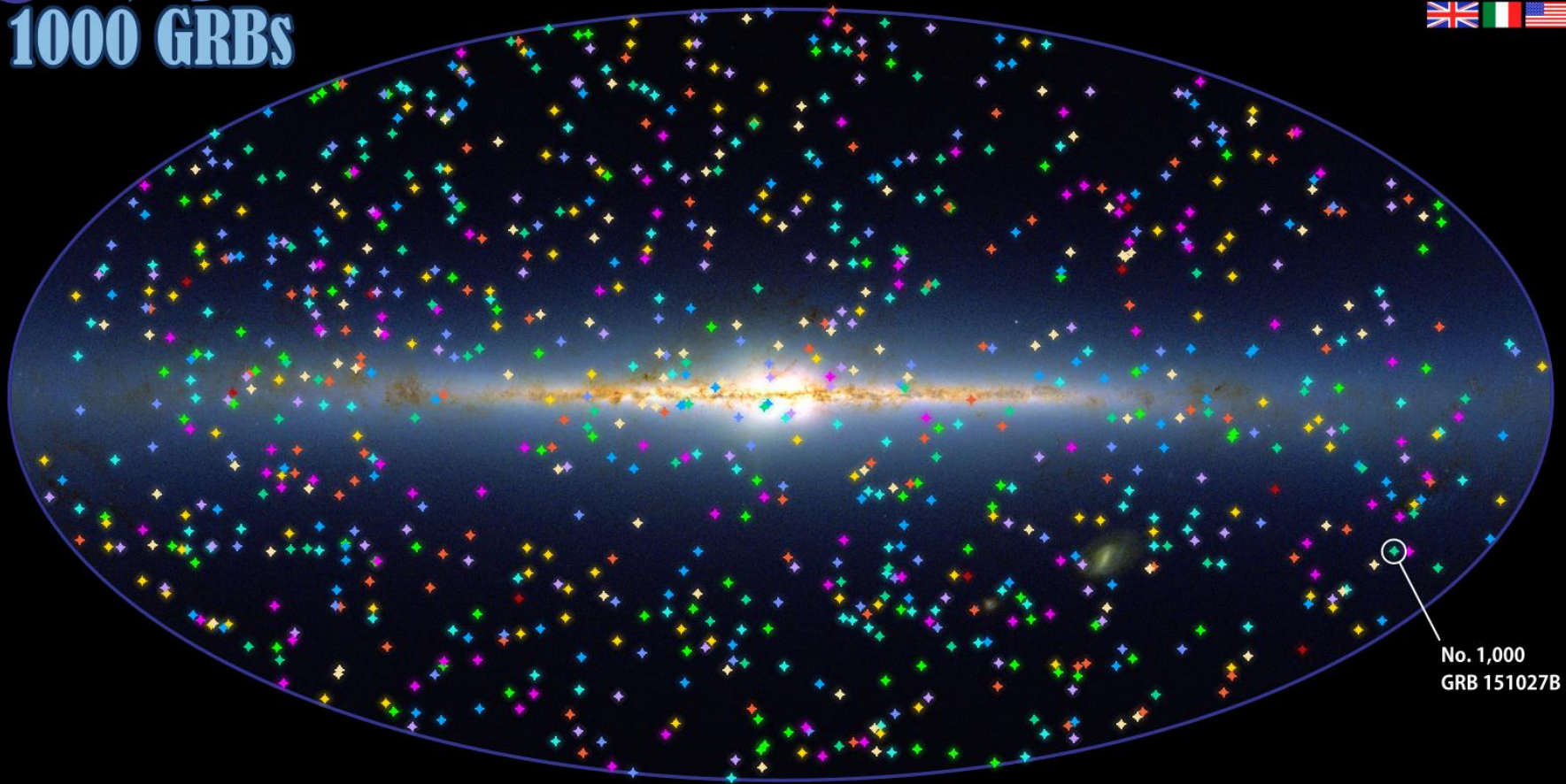


SWIFT



Storia di una missione di successo

Swift
1000 GRBs



No. 1,000
GRB 151027B

2004

9

2005

88

2006

102

2007

86

2008

103

2009

89

2010

84

2011

81

2012

92

2013

96

2014

95

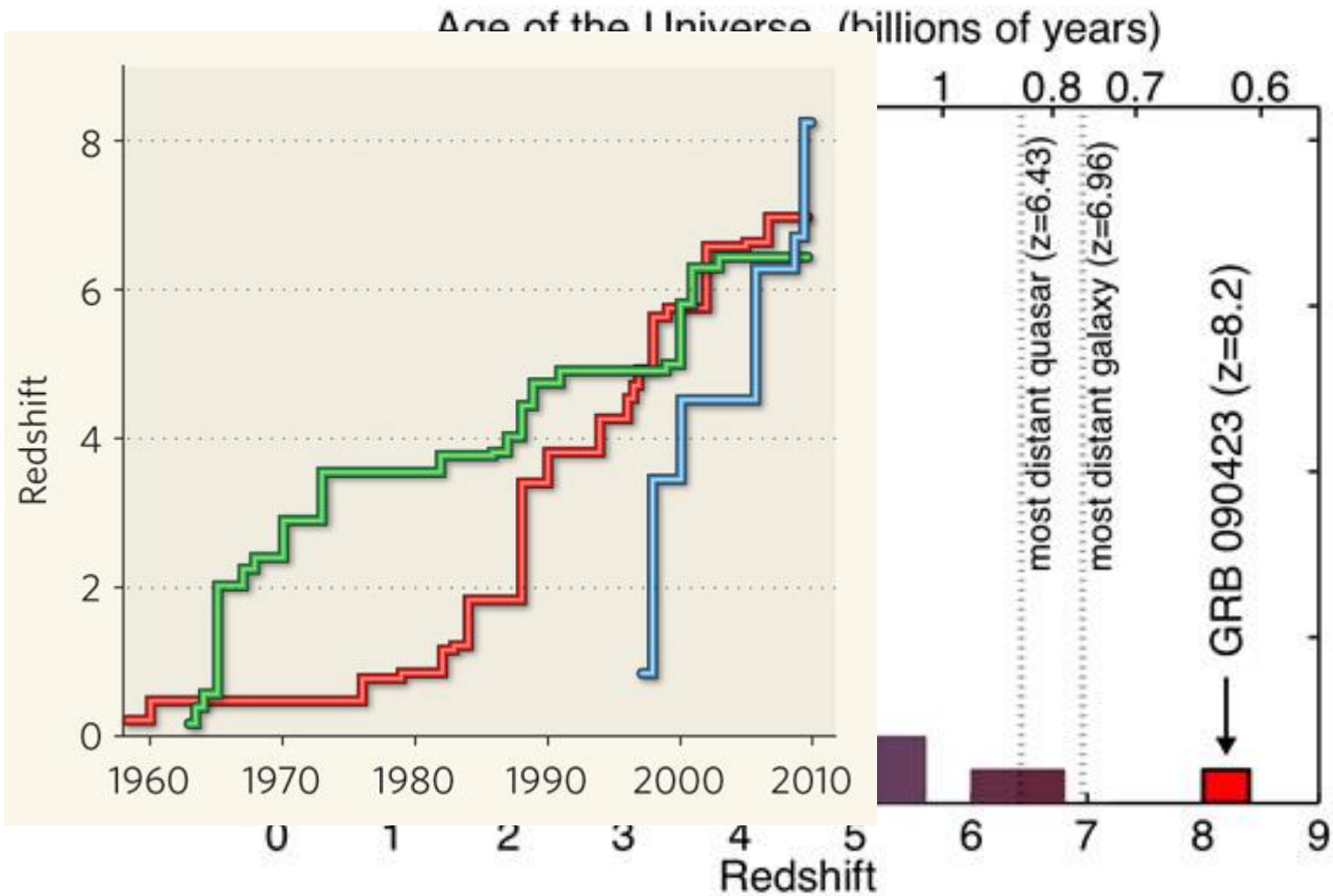
2015

75 to Oct. 27



GRB n. 1000 di Swift 27 ott. 2015

Swift: a GRB contribution to cosmology

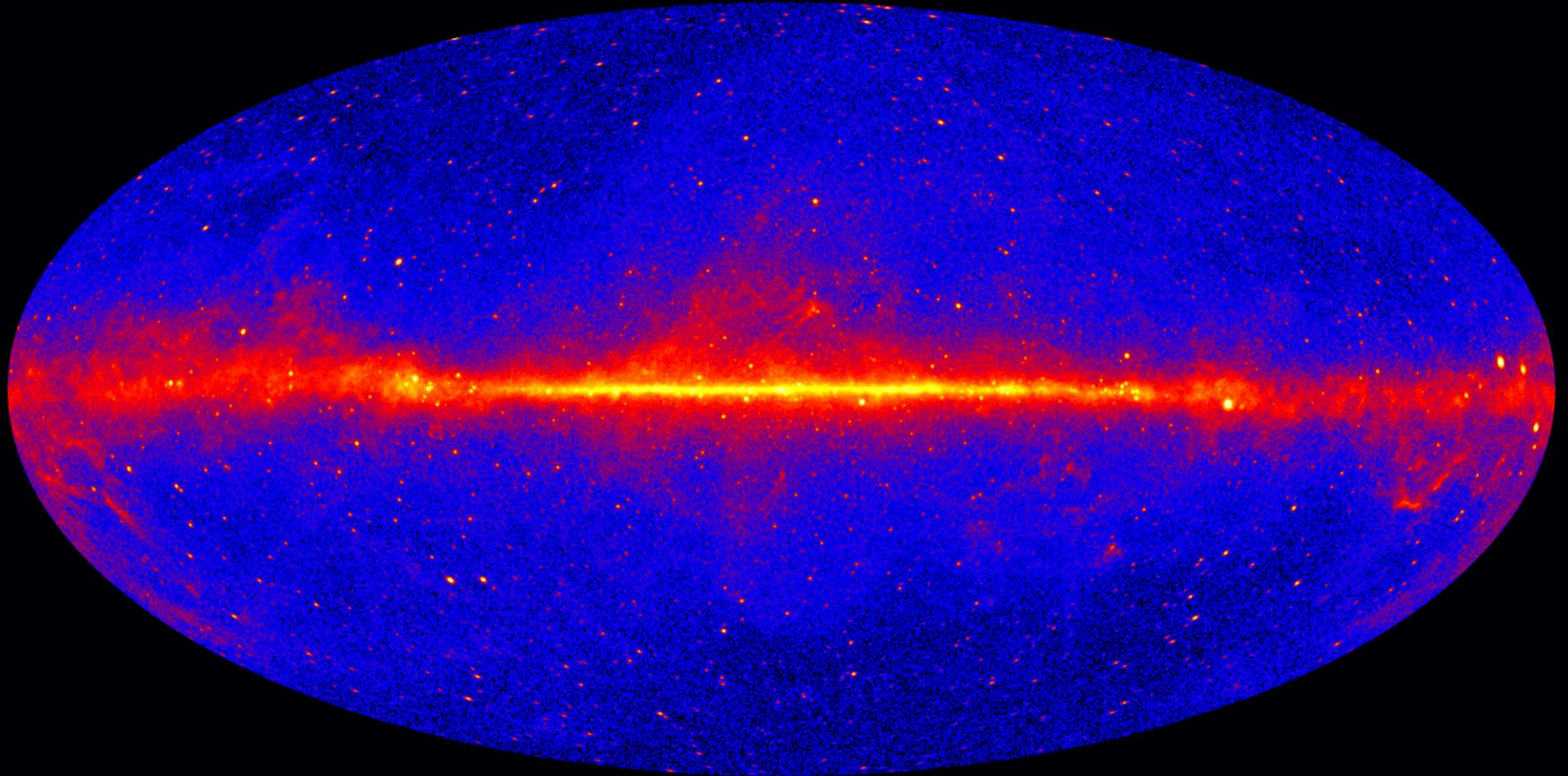


Credit: Edo Berger (Harvard/CfA)

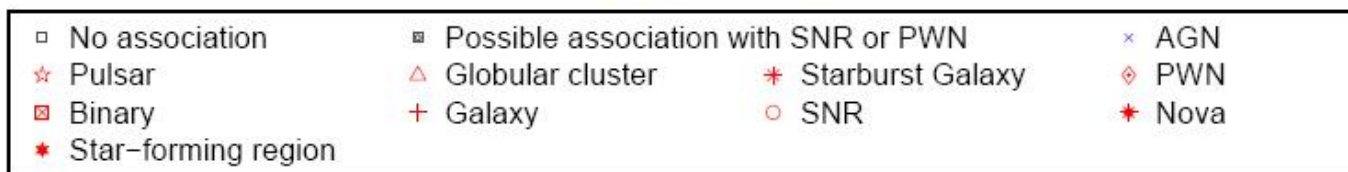
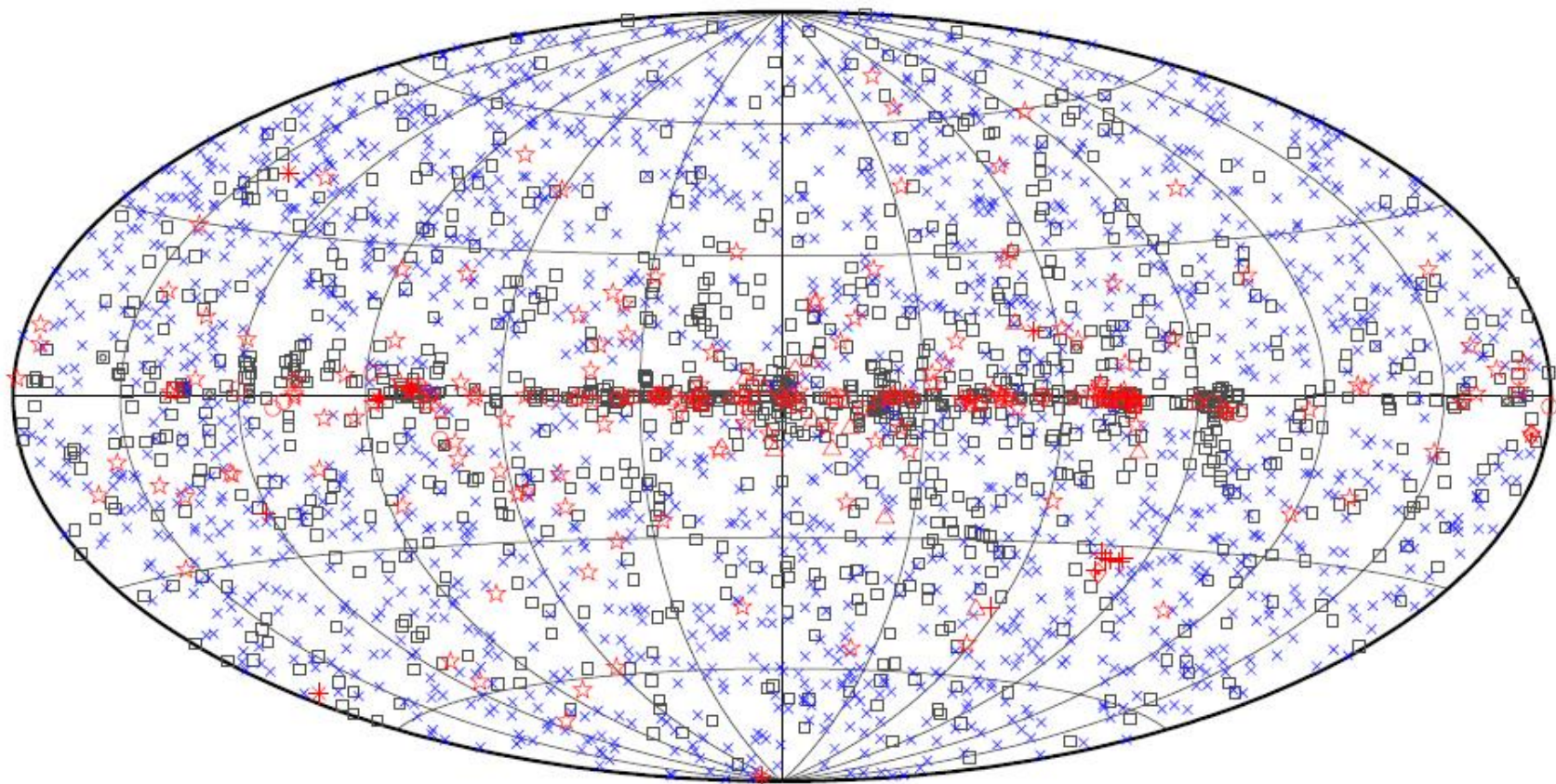


10
Fermi

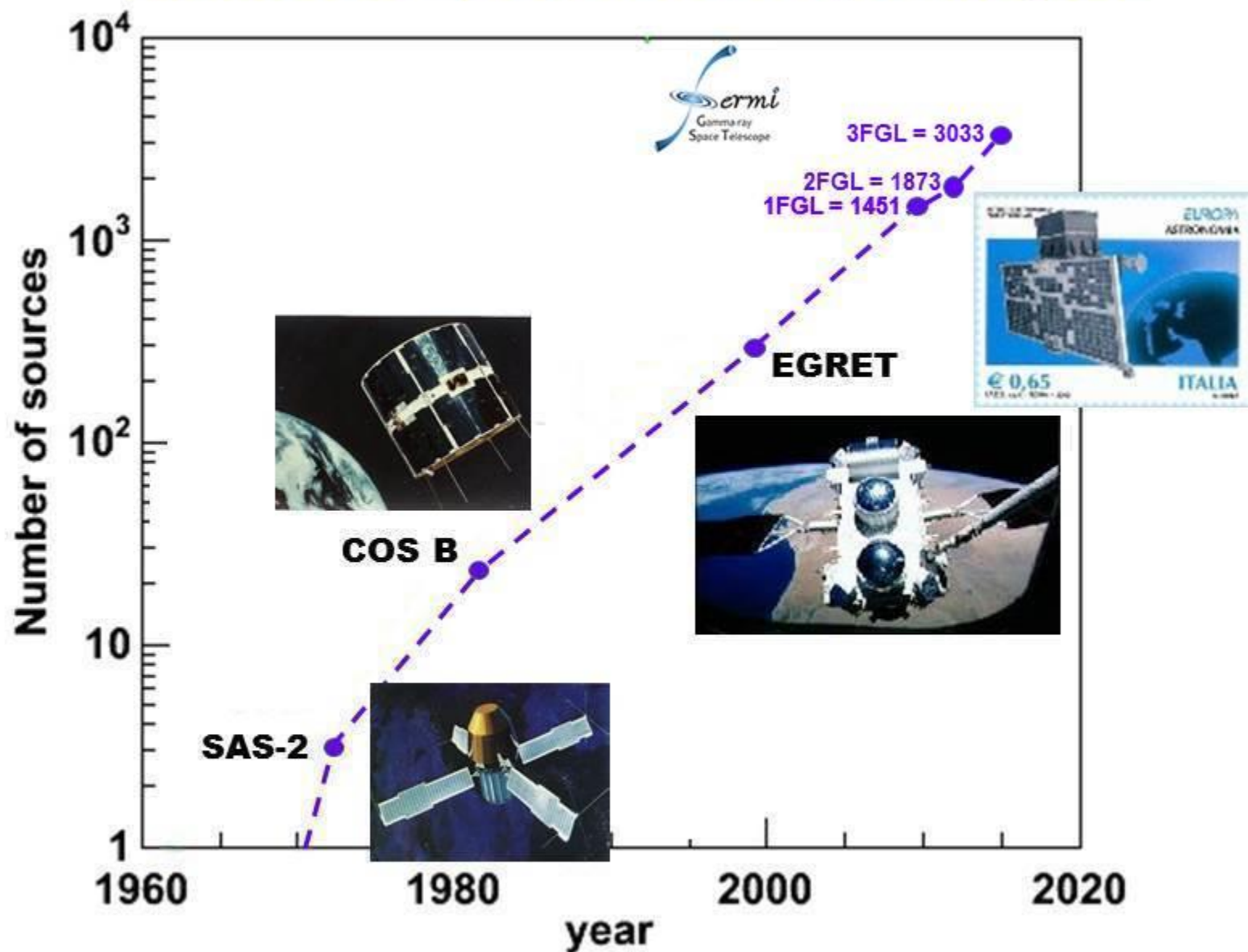
LAT 9-year Sky Map



>1 GeV for the interval ending August 2017

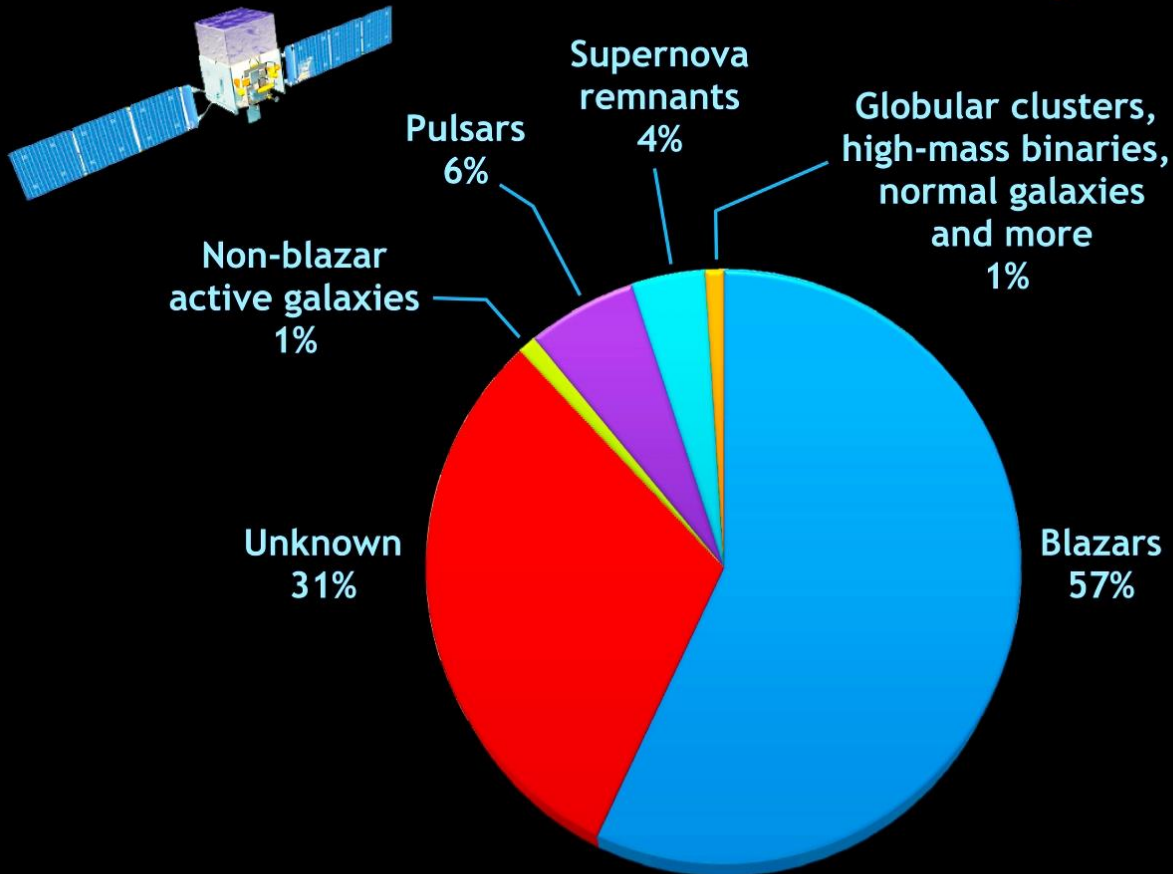


4 decades of γ -ray astronomy from space



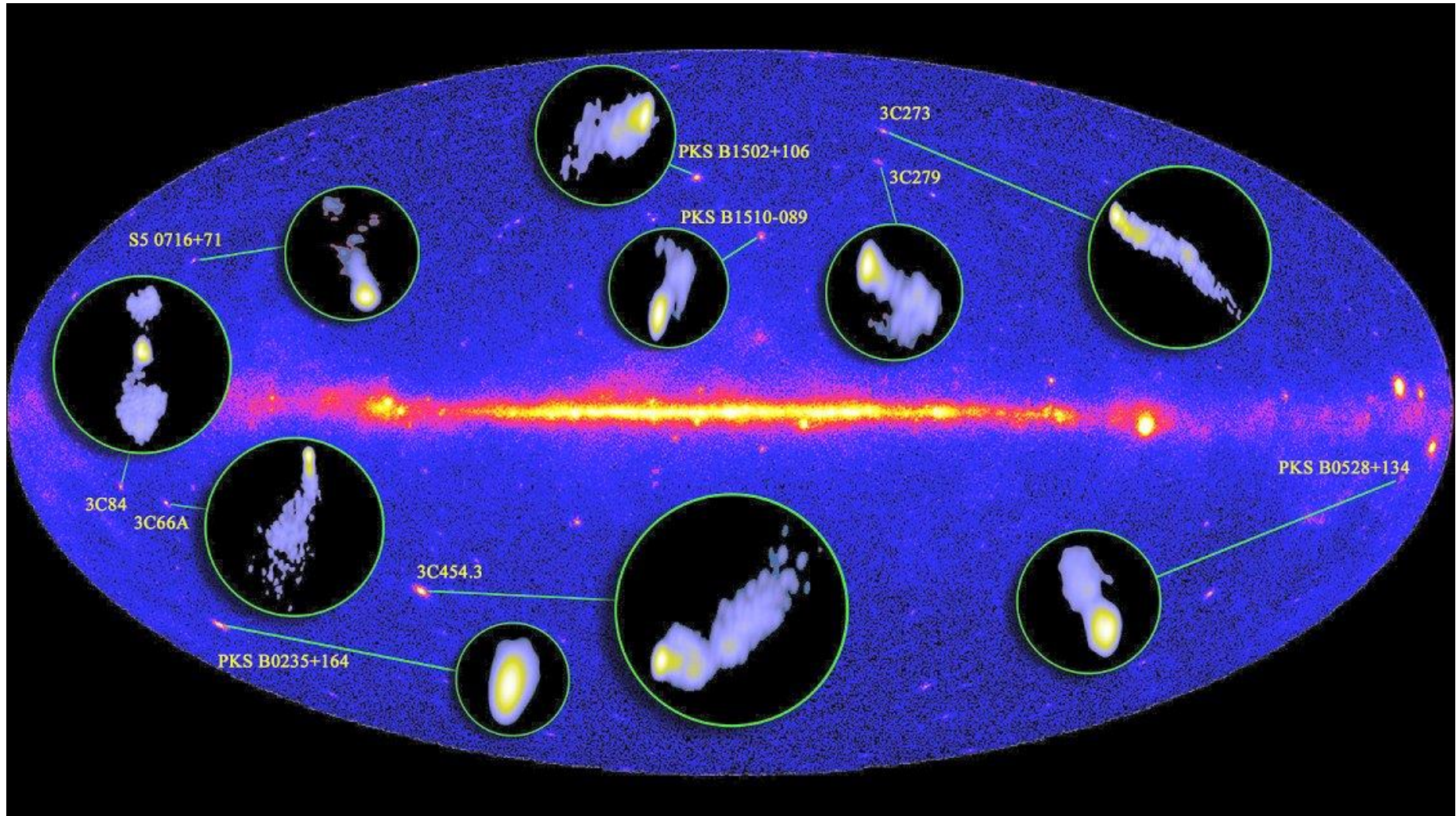
Gamma-ray sources

What has Fermi found: The LAT two-year catalog

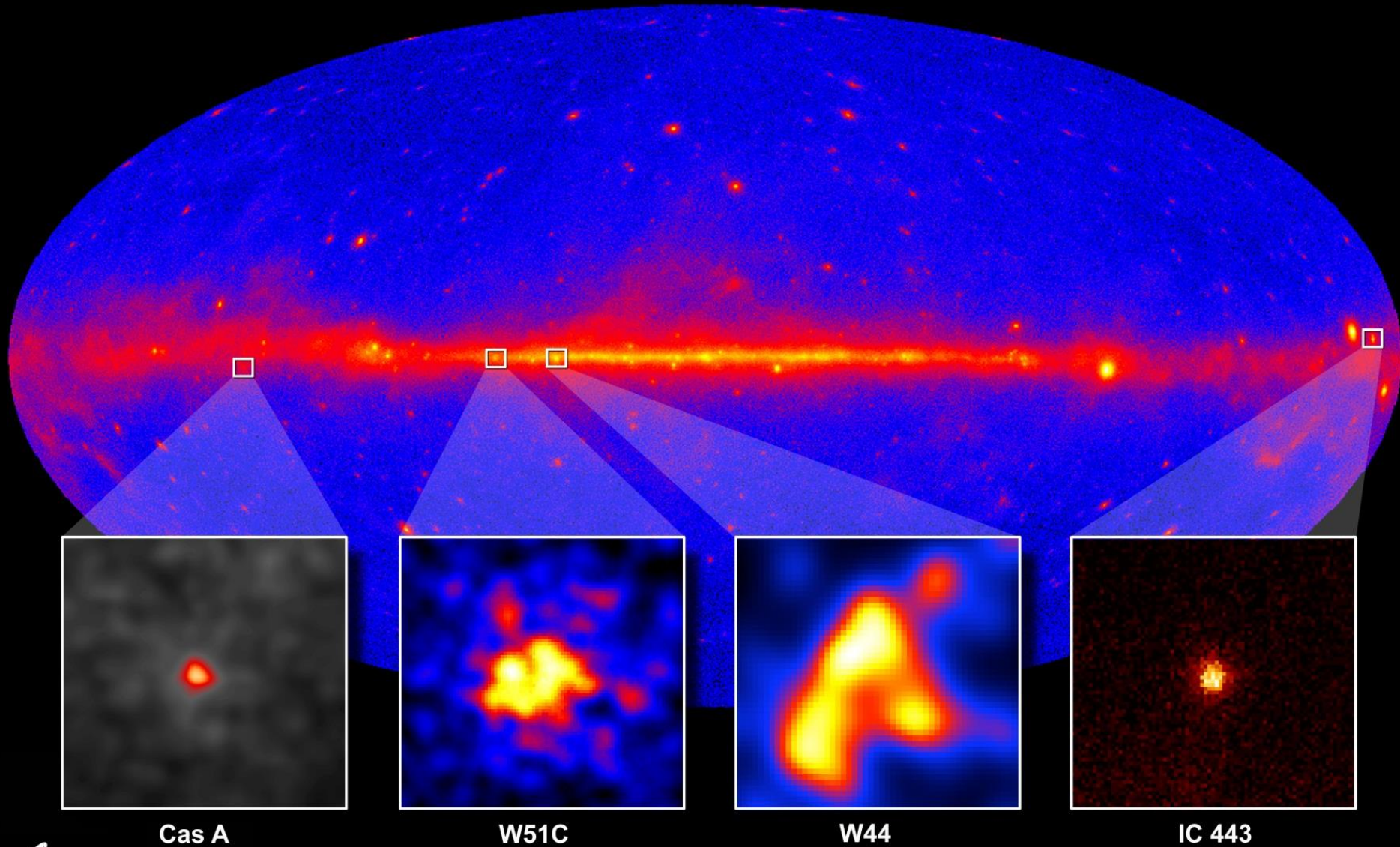


Credit: NASA/Goddard Space Flight Center

Il catalogo Fermi è dominato dagli AGNs....



Gamma-rays, CRs and supernovae: smoking gun evidence

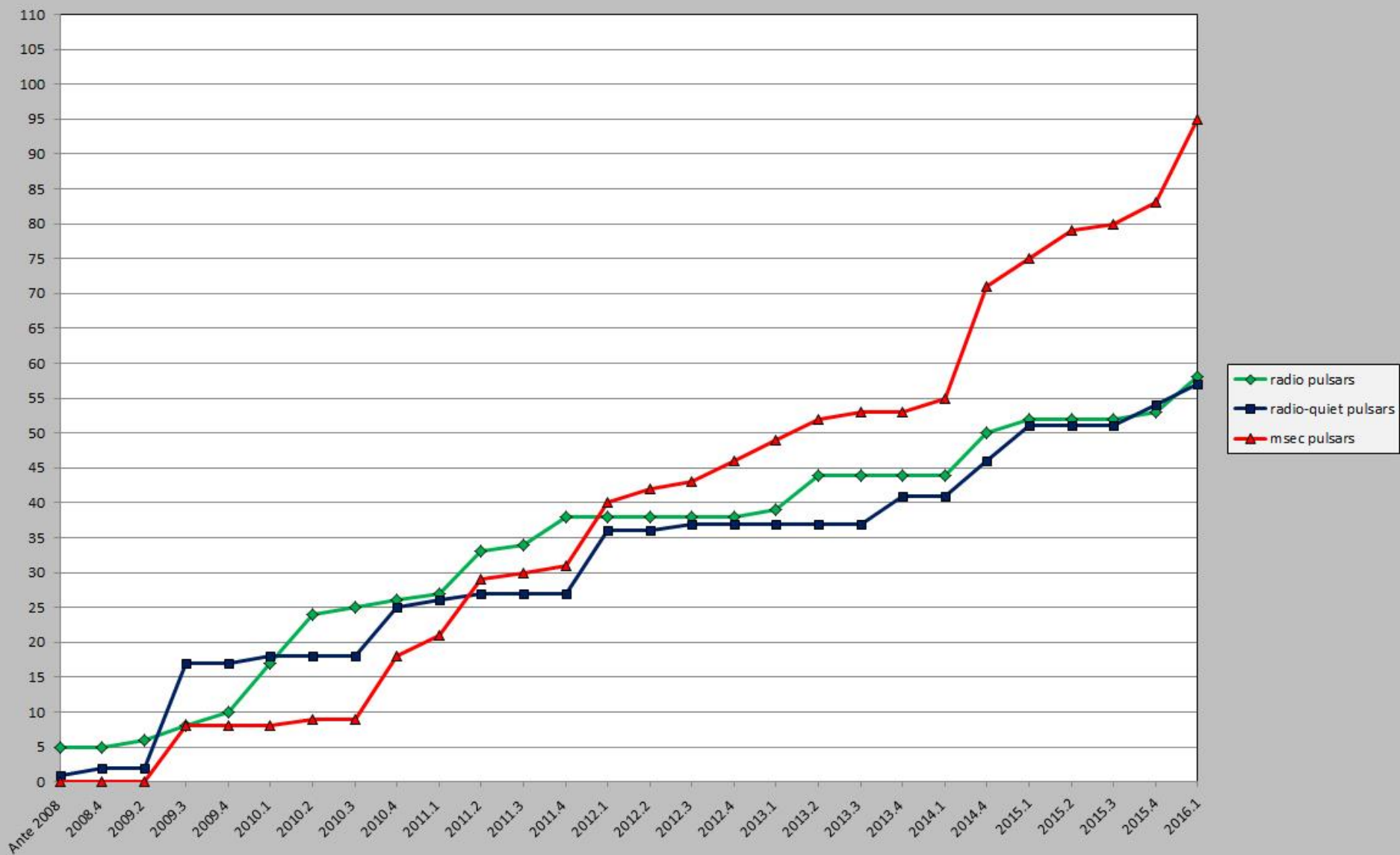


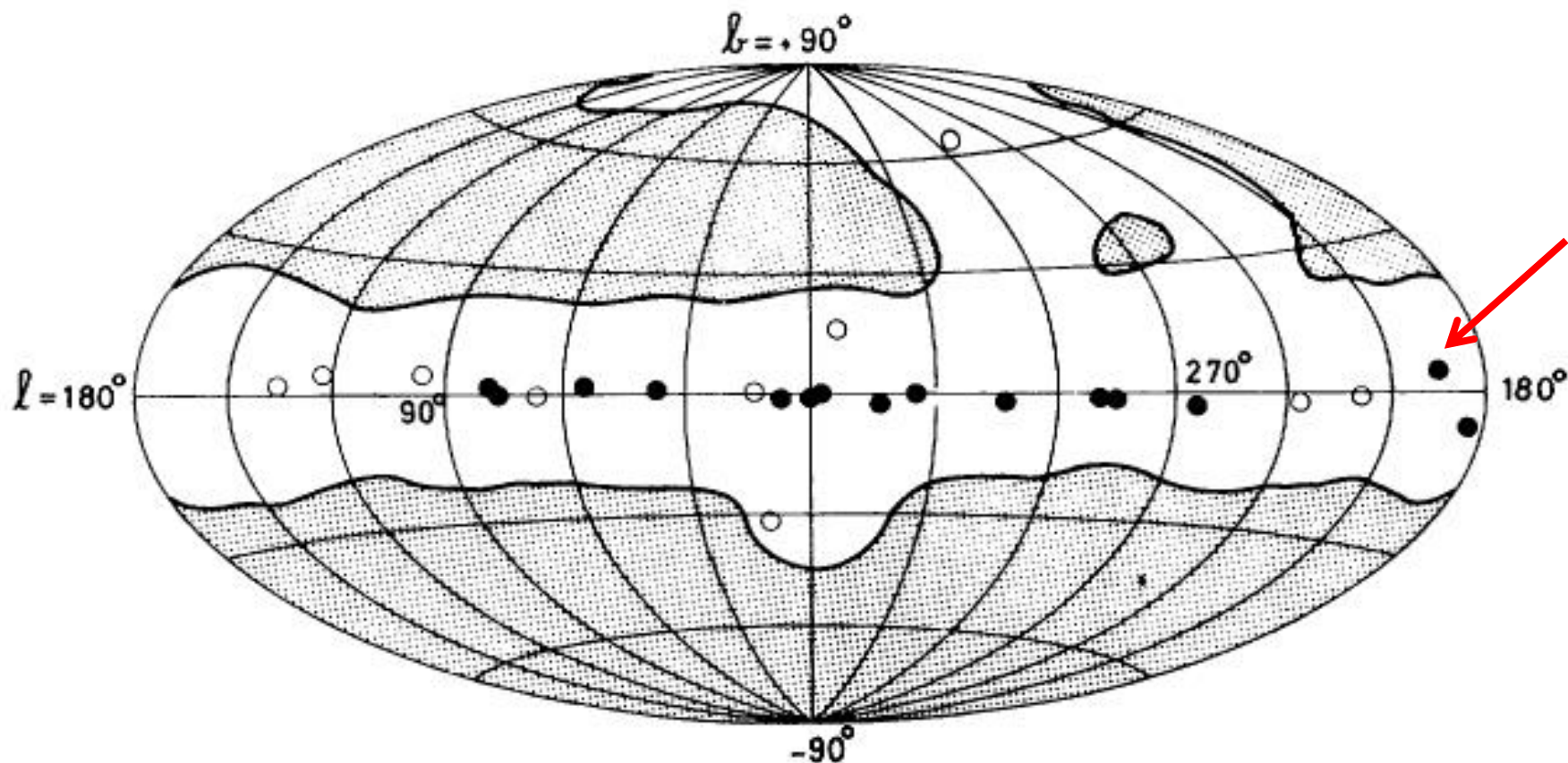
Cas A

W51C

W44

IC 443



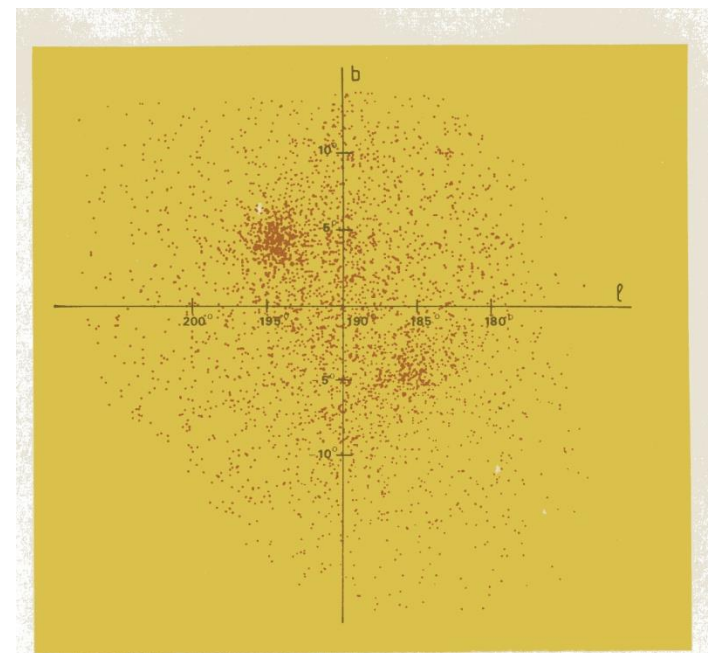
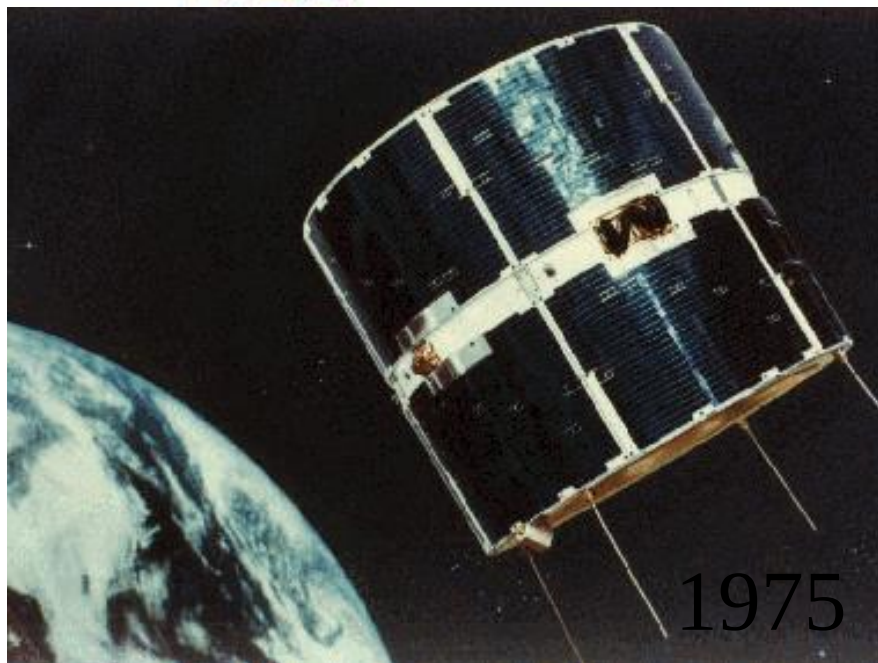
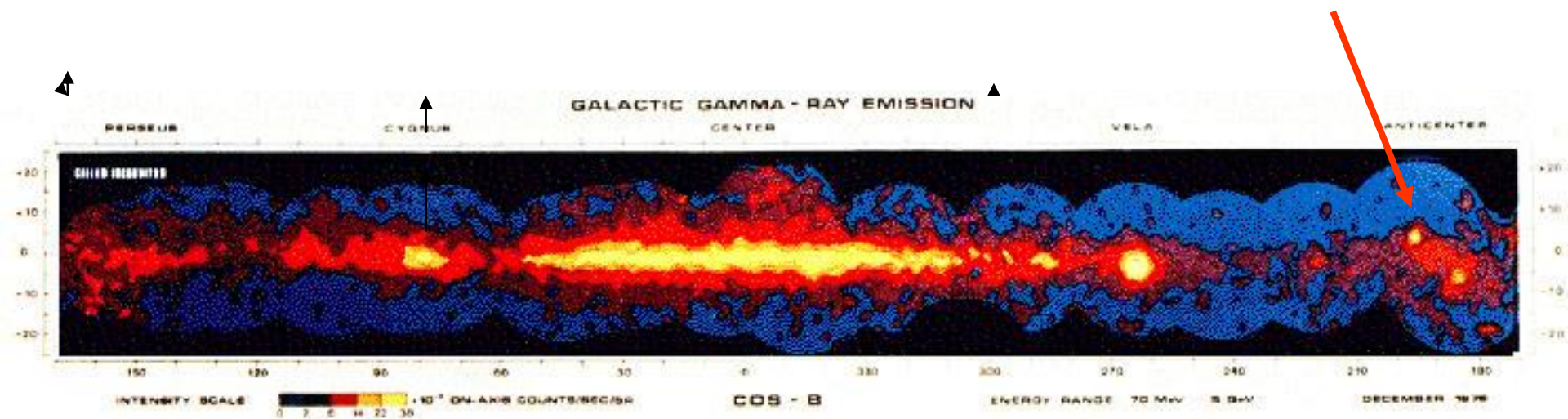


Gemin ga

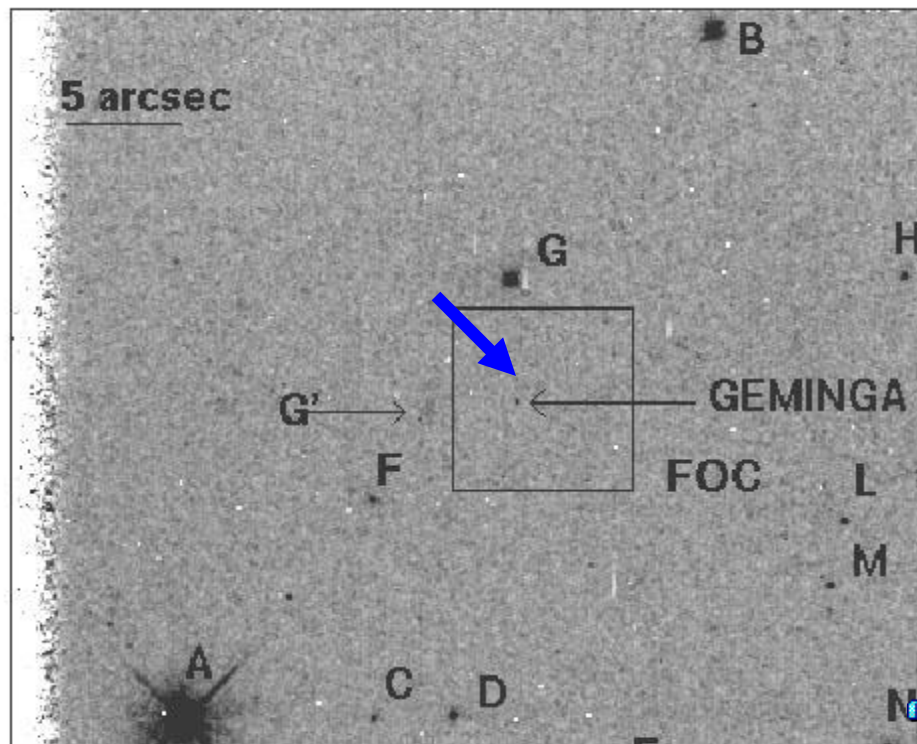
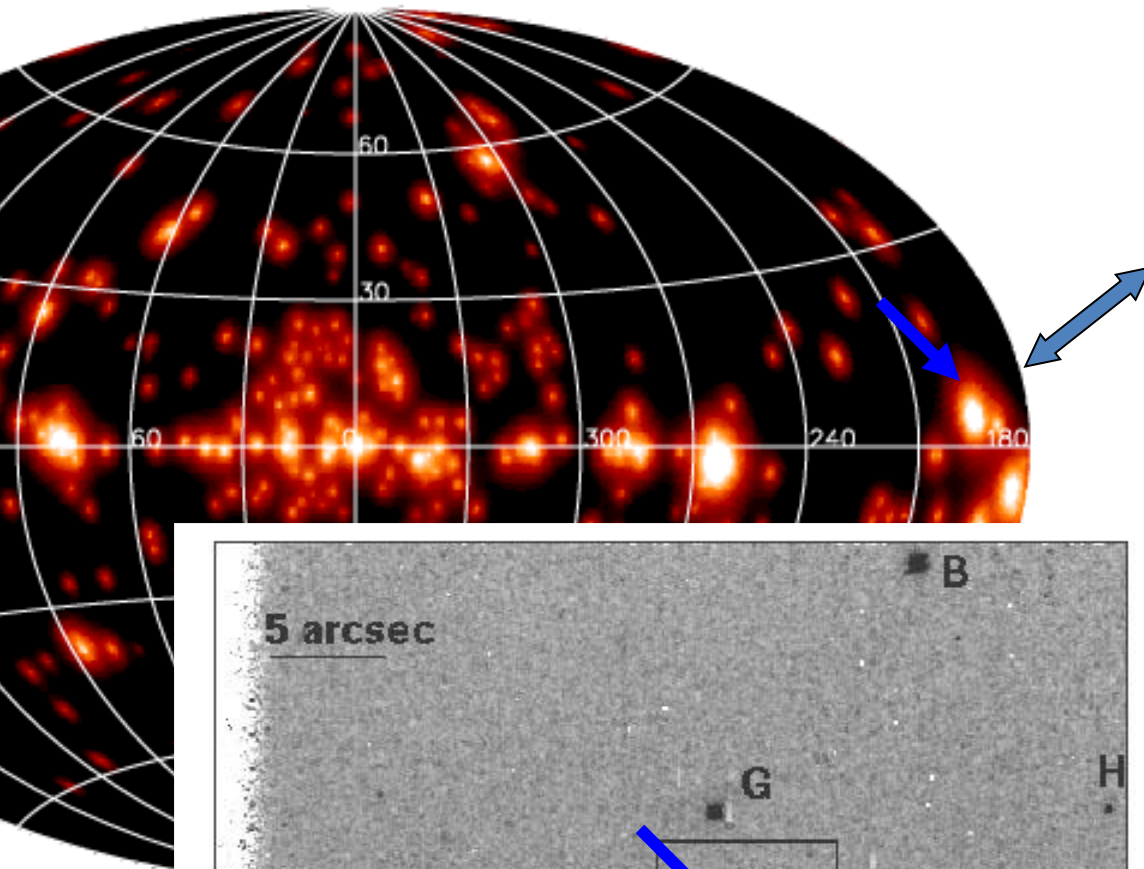
GEMINI constellation

Gamma-ray source

Gh'è minga



Geminga : la stella silenziosa



GEMINGA (2CG 195+04)

X-ray
the positioning
Einstein Observatory

80's

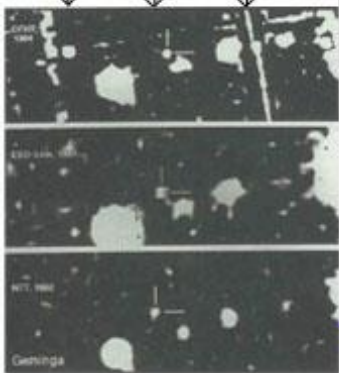
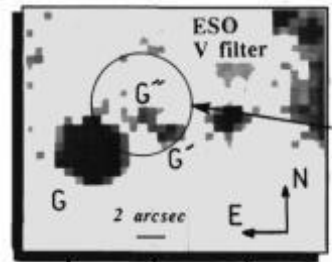
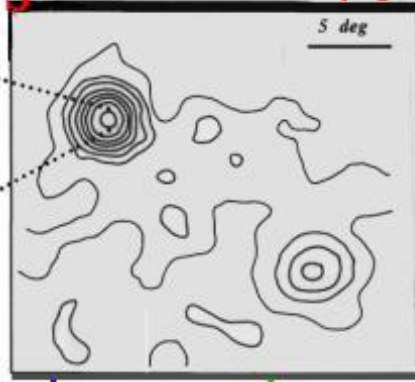
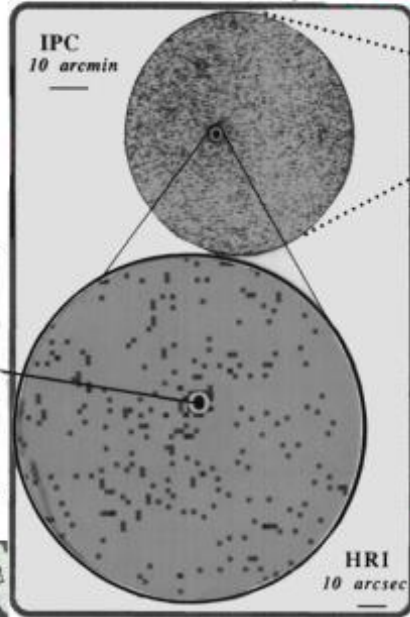
Gamma-Ray
the discovery
SAS-2 and COS-B

70's

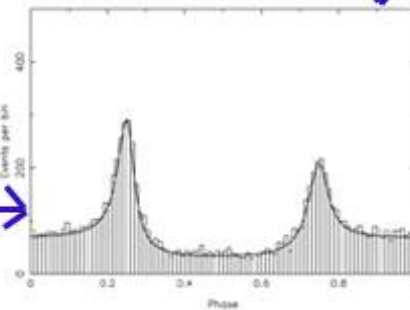
Ci sono voluti più di 20 anni per capire Geminga.

90's

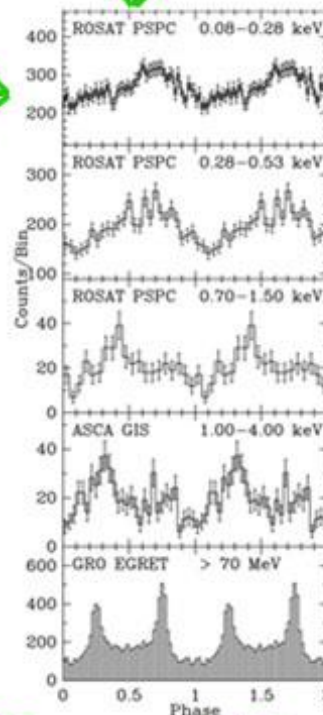
Optical
the understanding
ESO 3.6m - Palomar 5m



Proper motion
discovery '92



Egret phasogram, '98
the optical-γ connection



237 msec periodicity, '92
the x-γ connection

