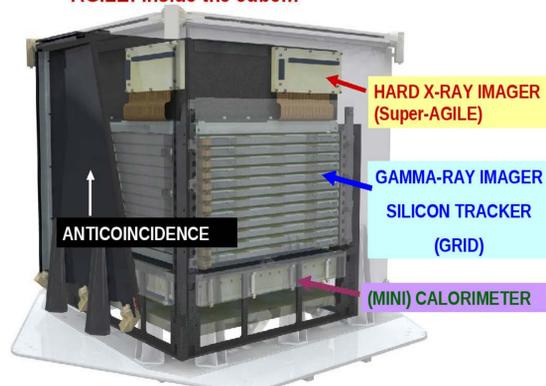
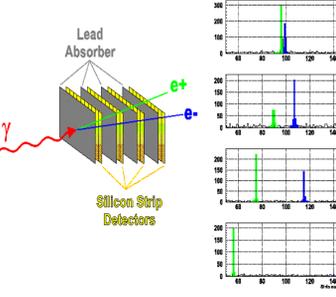


AGILE is a space mission of the Italian Space Agency (ASI) in joint collaboration with INAF, INFN and CIFS, dedicated to the observation of the high-energy Universe. The AGILE satellite was launched on April 23rd, 2007, and is devoted to gamma-ray astrophysics in the 30 MeV - 50 GeV energy range, with simultaneous X-ray imaging capability in the 18-60 keV band. Despite the small size and budget, AGILE produced several important scientific results, among which the unexpected discovery of strong flares from the Crab Nebula. This discovery won to the AGILE PI and the AGILE Team the prestigious “Bruno Rossi Prize” in 2012. Thanks to its sky monitoring capability and fast ground segment alert system, AGILE is substantially improving our knowledge of the gamma-ray sky. *C. Pittori, on behalf of the AGILE Collaboration*

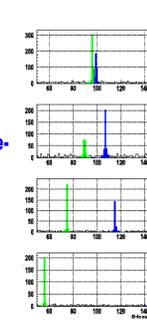
**AGILE: inside the cube...**



**HARD X-RAY IMAGER (Super-AGILE)**  
**GAMMA-RAY IMAGER SILICON TRACKER (GRID)**  
**(MINI) CALORIMETER**  
**ANTICOINCIDENCE**



Lead Absorber  
 $\gamma$   
 $e^+$   
 $e^-$   
 Silicon Strip Detectors

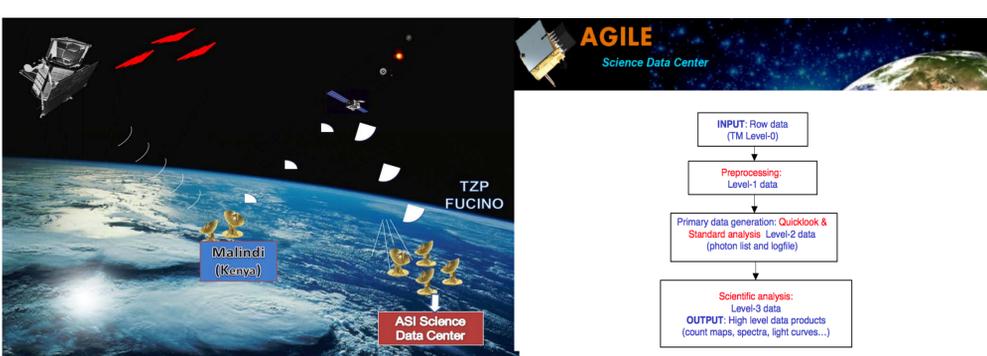


**AGILE (Astrorivelatore Gamma a Immagini LEggero): the most compact instrument for high-energy astrophysics: Payload ~ 130 kg - Total ~ 300 kg**



**AGILE Data Center @ ASDC**

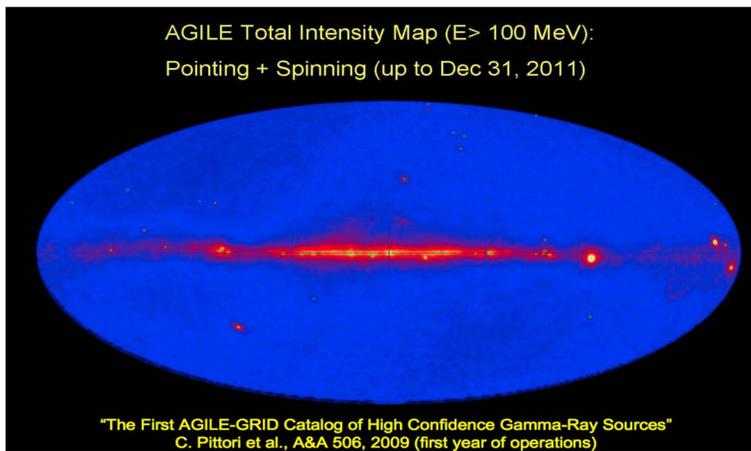
The AGILE Data Center (ADC), part of ASDC, located in Frascati, Italy, is the scientific part of the AGILE Ground Segment. ADC is in charge of all the scientific oriented activities related to the analysis, archiving and distribution of AGILE data:



INPUT: Raw data (TM Level-0)  
 Preprocessing: Level-1 data  
 Primary data generation: Quicklook & Standard analysis: Level-2 data (photon list and loglike)  
 Scientific analysis: Level-3 data  
 OUTPUT: High level data products (count maps, spectra, light curves...)



AGILE Science Data Center  
 TSP FUCINO  
 Malindi (Kenya)  
 ASI Science Data Center

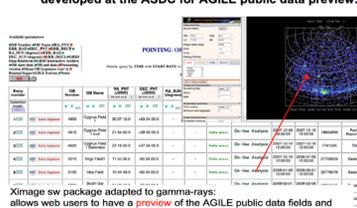


The First AGILE-GRID Catalog of High Confidence Gamma-Ray Sources



ASDC interactive catalogs webpages

New interactive on-line analysis tool in MMIA developed at the ASDC for AGILE public data preview:

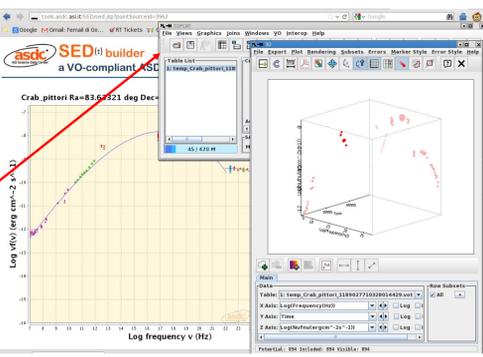


Ximage sw package adapted to gamma-rays: allows web users to have a preview of the AGILE public data fields and perform an interactive preliminary analysis around a chosen sky position.

**ASDC interactive tools**



SED builder [V2.1] a VO-compliant ASDC tool

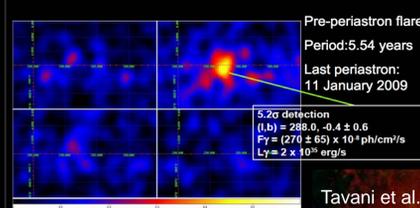


SED builder a VO-compliant ASDC tool

<http://www.asdc.asi.it>

## Eta-Car Colliding Wind Binary System

The 11-13th Oct 2008 Eta Car Flare



Pre-periastron flare  
 Period: 5.54 years  
 Last periastron: 11 January 2009

5.2 $\sigma$  detection  
 $(l,b) = 288.0, -0.4 \pm 0.6$   
 $\dot{\gamma} = (270 \pm 65) \times 10^{-11}$  ph/cm<sup>2</sup>/s  
 $L_{\dot{\gamma}} = 2 \times 10^{36}$  erg/s

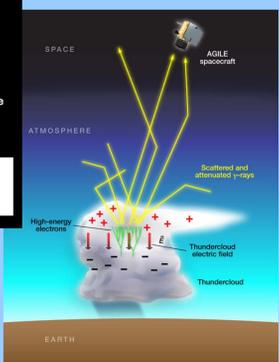
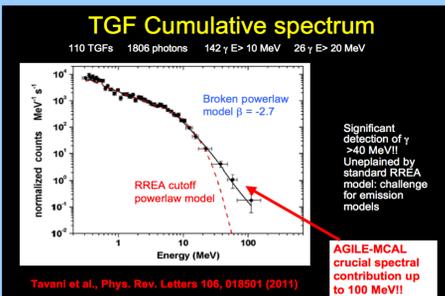
Tavani et al., ApJ 698, 2009

**AGILE detects  $\gamma$ -ray emission from the Eta-Carinae region.**



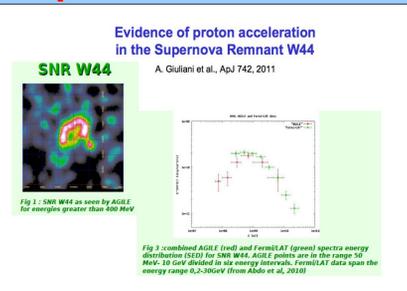
Emission above 100 MeV from the collision wind of a binary star was observed for the first time.

## Terrestrial Gamma-ray Flashes

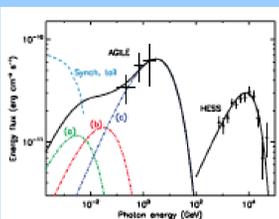


## Main AGILE Discoveries:

### Supernova Remnants

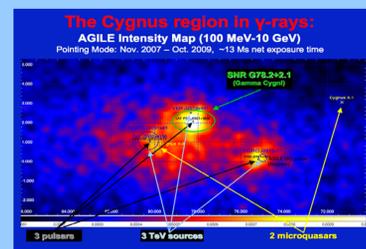


### Vela-X Pulsar Wind Nebula

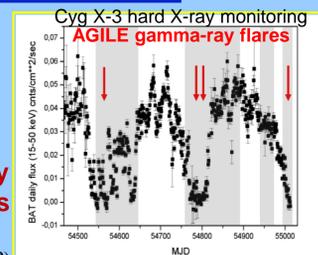


AGILE has provided the first experimental confirmation of emission above 100 MeV from a pulsar wind nebula (Pellizzoni et al., Science 327, 2010)

## Cygnus Region Microquasars



- AGILE detects weak persistent emission above 100 MeV and several gamma-ray flares from Cygnus X-3 microquasar (Tavani et al., Nature 462 (2009))
- Fermi confirms AGILE detections, and measures the orbital period of the binary system. (Abdo et al., Science 326 (2009))

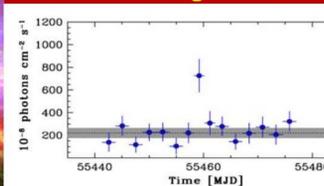


Cygnus X-3 is able to accelerate particles up to relativistic energies and to emit  $\gamma$ -rays above 100 MeV.

## The surprising Crab Nebula in gamma rays

### The Crab Nebula: a standard candle...?

FIRST PUBLIC ANNOUNCEMENT  
 Sept. 22, 2010: AGILE issues the Astronomer's Telegram n. 2855



### The variable Crab Nebula !

AGILE first detection of a strong gamma-ray flare in Oct. 2007

