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Evento di Presentazione
Aula Magna P. Gismondi
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- Past
- Present
- Future

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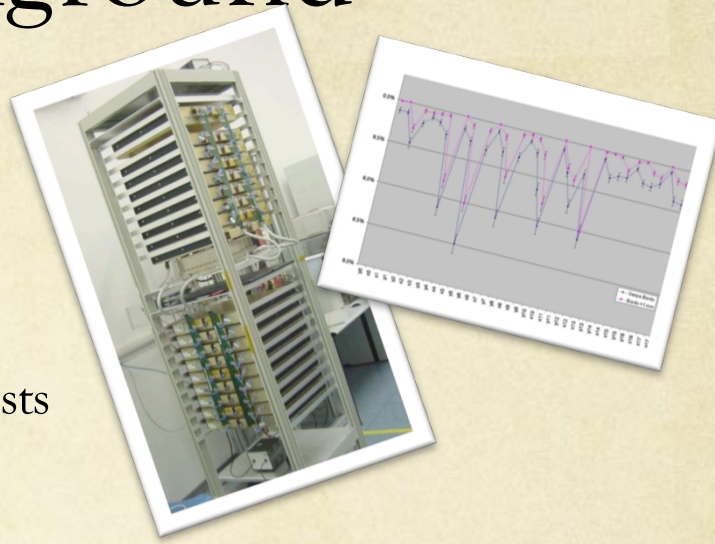
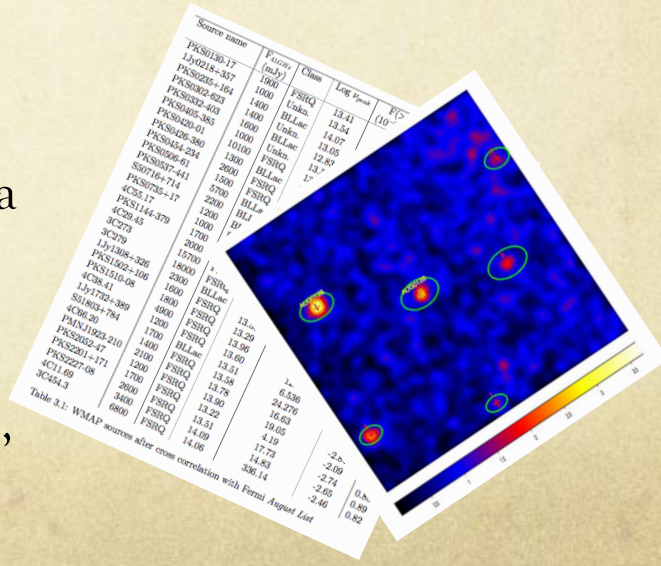
- Present
- Future

Educational Background

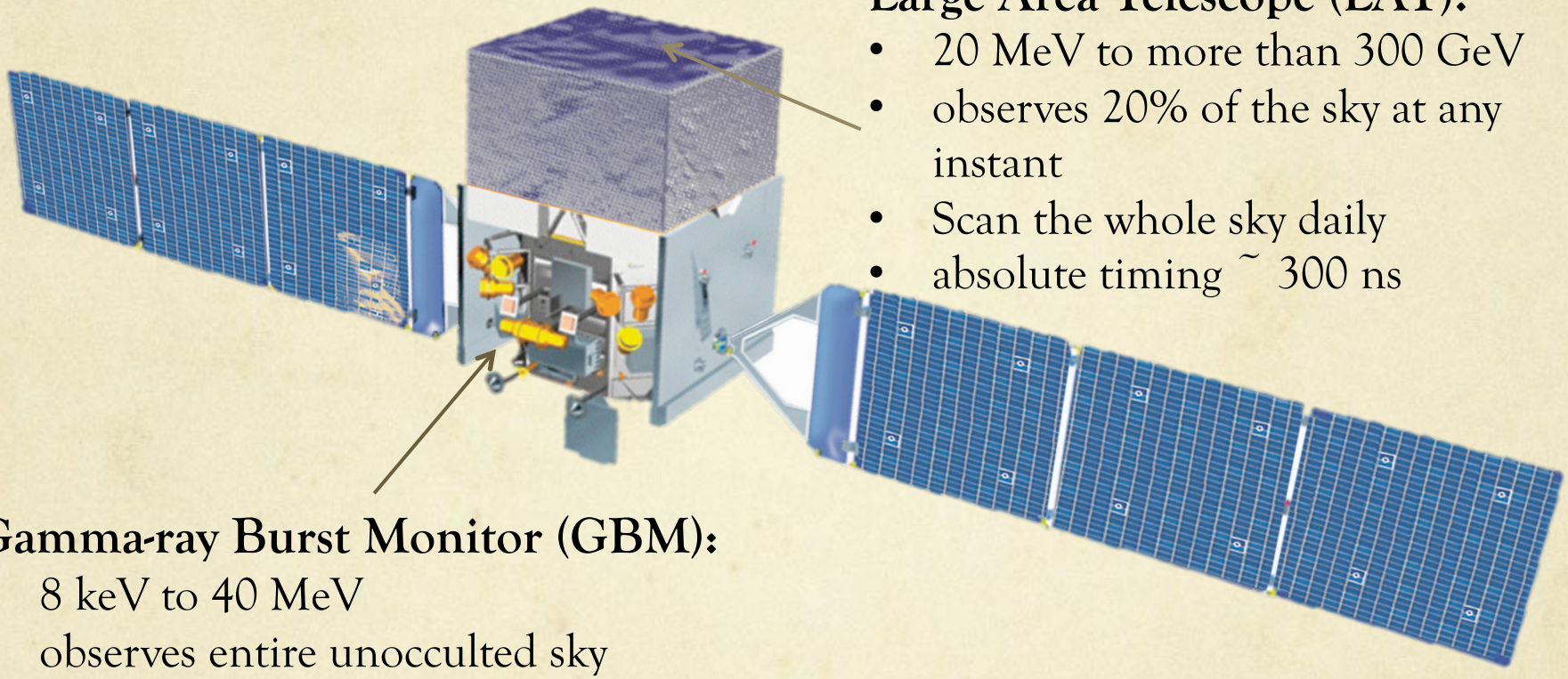


- Graduated at Perugia University in 2005
  - Master Thesis: Studio e caratterizzazione dei singoli moduli del tracciatore-convertitore di GLAST.
    - Skills acquired: electric and thermal/void tests silicon trackers, instrumental data taking , hardware experimental setup



- PhD Student from 2006 to 2009 (Perugia and ASDC)
  - PhD Thesis: Study of gamma–ray properties of a microwave-selected sample of blazars
    - New astrophysical expertize: gamma rays sources, blazars, emission processes
    - Technical expertize in space based data archive, cross match tool, standards for satellite data

The Fermi observatory



Large Area Telescope (LAT):

- 20 MeV to more than 300 GeV
- observes 20% of the sky at any instant
- Scan the whole sky daily
- absolute timing ~ 300 ns

Gamma-ray Burst Monitor (GBM):

- 8 keV to 40 MeV
- observes entire unocculted sky
- absolute timing ~ 2 μ s
- compute burst location to allow re-orienting Fermi

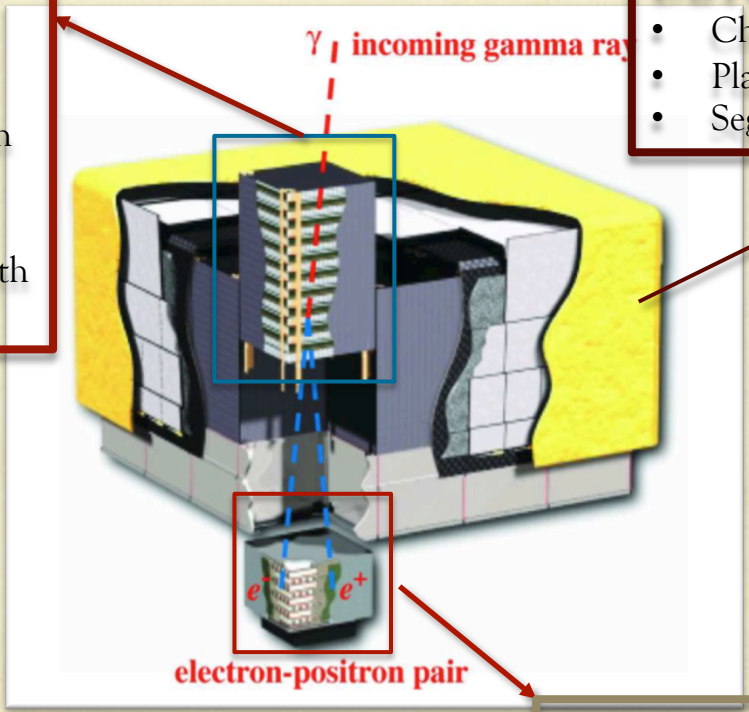
The Fermi-LAT detector

TRACKER-CONVERTER

- Incoming particle direction
- 18 x,y tracking planes: SSD
- 16 planes of tungsten
  - "FRONT" --> first 12 "thin" layers of 3% radiation length tungsten converters
  - "BACK" --> next 4 "thick" layers of 18% radiation length tungsten converters

ANTICOINCIDENCE DETECTOR

- Charged particle bkg rejection
- Plastic Scintillator, WLS Fibers
- Segmented tiles

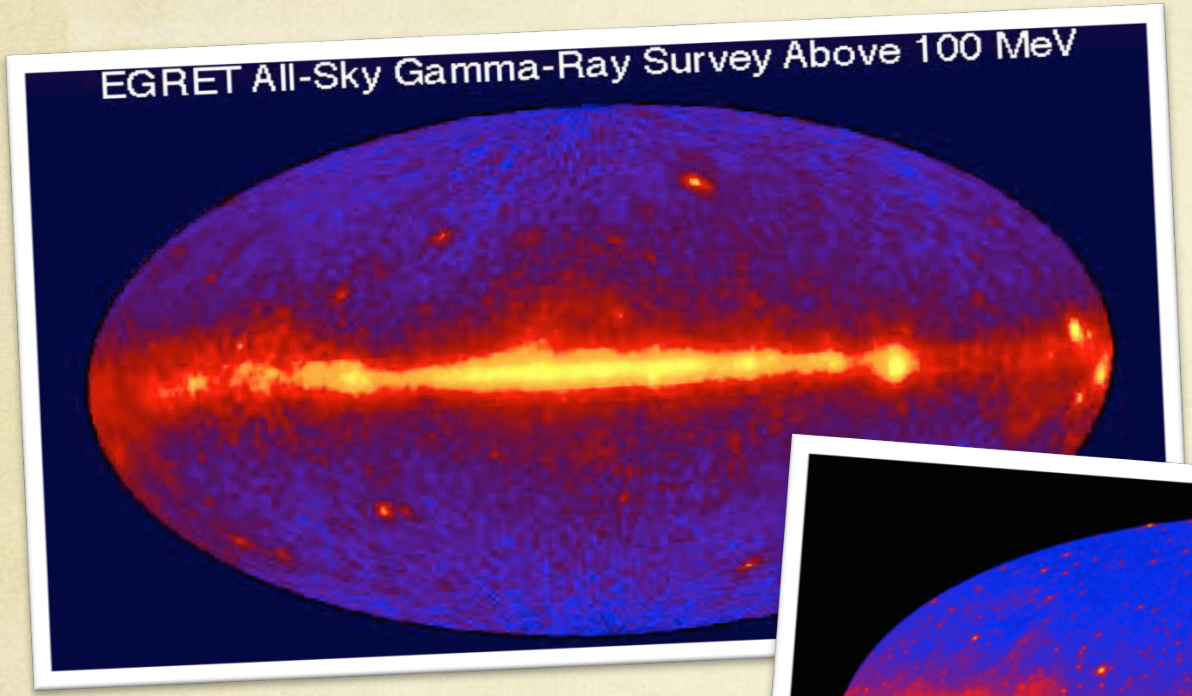


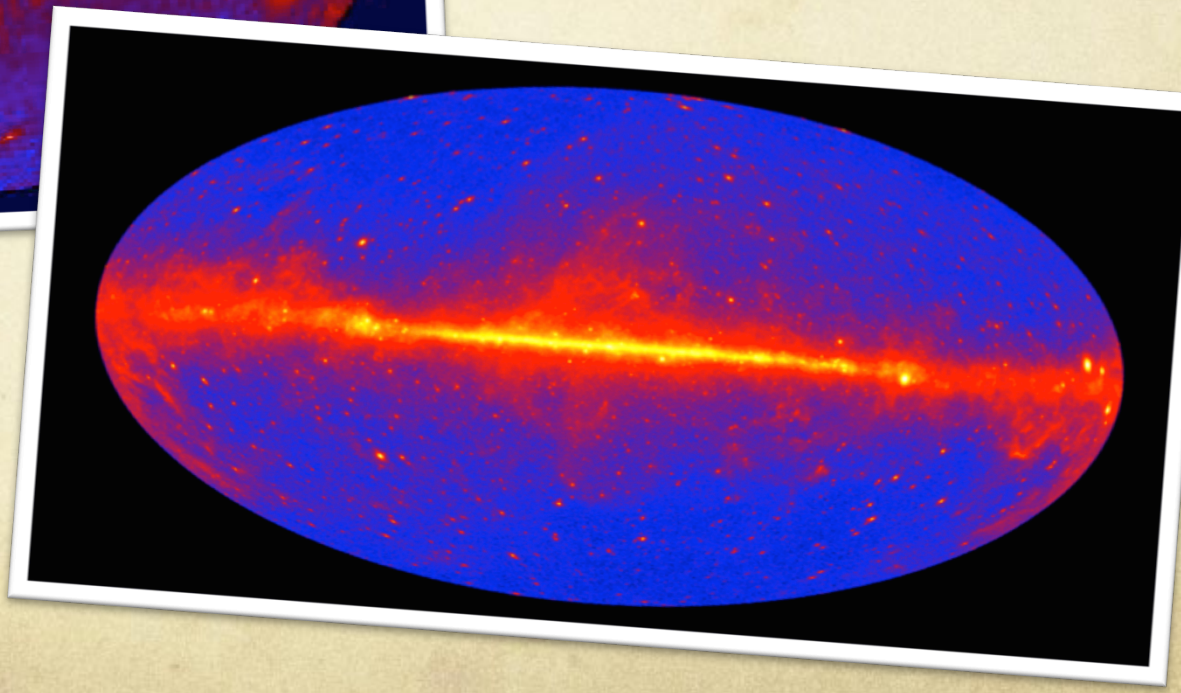
Calorimeter

- Energy deposition
- Shower development Imaging
- Segmented 96 CsI(Tl) crystals

Pass8 = complete revamp of event reconstruction algorithms (2015)
Improved performances and IRF
Retroactively updated entire data archive
Open new discovery space

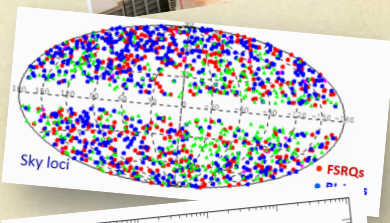
Terrific improvement

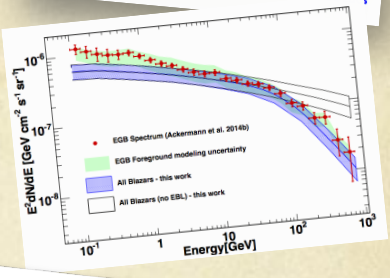


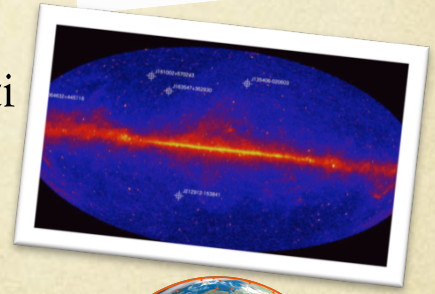


Fermi highlights

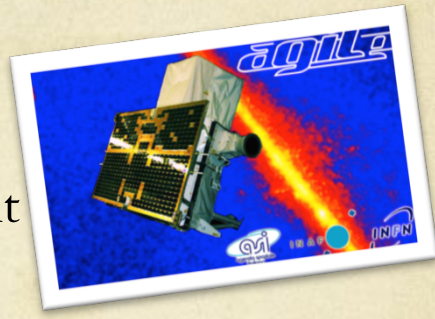
- Member of the Fermi-LAT collaboration since 2004, my main interests are blazars and population studies
  - Corresponding author for most of the AGN catalog released by Fermi collaboration (*LAC, *FHL, etc.)
  - Co-author of 2 papers of population studies of BL LACs sample and estimation of gamma ray background
  - Published the detection of the further gamma-ray blazar (z=4.31) up to now
  - Many other works on single sources with Fermi and Multi wavelength data
  - One of the manager of the Italian mirror of Fermi-LAT data archive available at SSDC
  - Developed the software for Fermi LAT on-line Data Analysis at SSDC







Other Missions



- AGILE (2005/2008)
  - Scientific analysis with production of count map and light curves for AGILE observed sources
  - Test of interactive online pipeline for the analysis of the first real AGILE data e confirmation of the scientific outcome of the pipeline products.

- EGRET (2005)
  - Application of an algorithm of Minimum Spanning Tree to EGRET data for source detection
- ASTRI (2014)
  - Support for development of a software for the visualization of the data of the Italian prototype

Responsibilities

- Flare Advocate Coordinator from July 2009 to March 2016
- Data Quality Monitoring Expert since May2014
- Blazars & other AGNs scientific Group Coordinator from September 2014 to March 2016
- Responsible of WP “Fermi” in ASI-INFN agreement for SSDC

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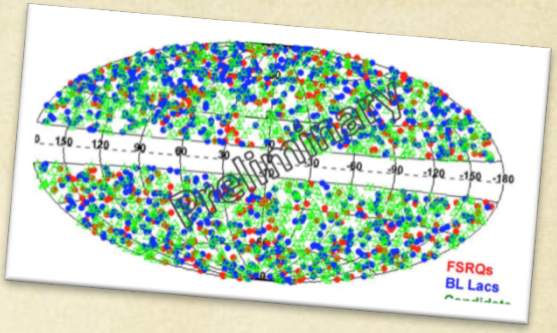
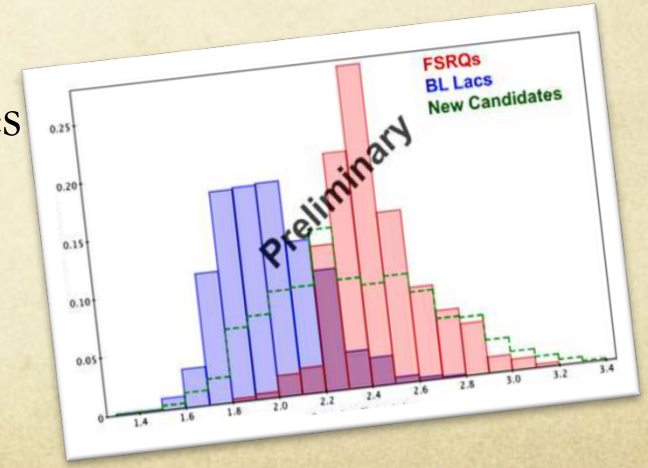
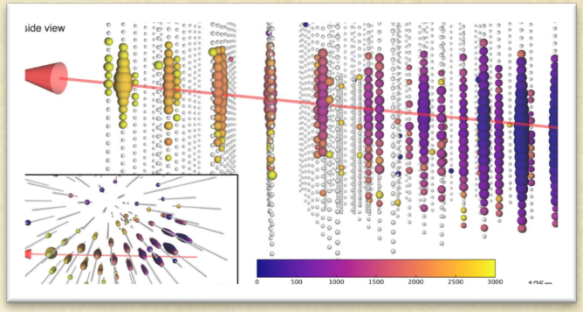
Building a catalog

- Leading person of the 4° catalog of Fermi-LAT AGN
  - We developed an algorithm to associate Fermi source to low energy counterparts based on Likelihood Ratio method
  - The use of surveys like NVSS, SUMSS, RASS helps us to find counterpart out of catalogs, opening a possible new discovery space
  - In parallel we search for redshift and classes in order to give a solid sample to the following population studies

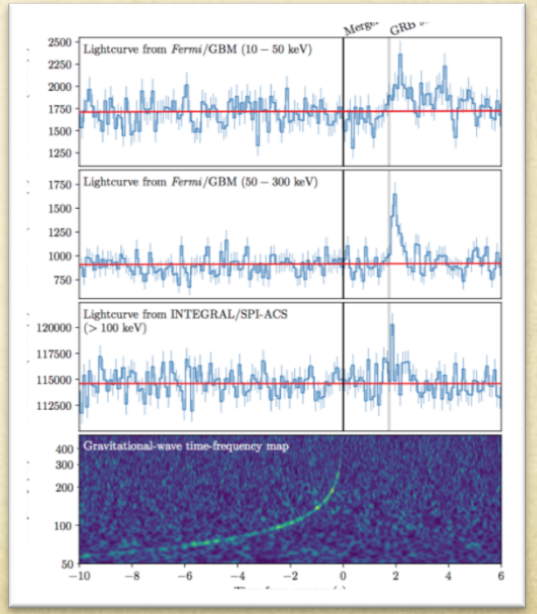




Watching the sky



- With the rise of Multi Messenger astronomy, gamma ray monitoring is crucial for GW and Neutrino source counterparts.
- I am helping to develop a software to process these events faster using Flare Advocate experience
- Fermi (and AGILE) is the only satellite can cover gamma-ray band since no gamma ray all-sky monitor are expected in the future.



ASI- INFN agreement

- ASDC and Earth observation merged in the new ASI "Space Science Data Center" (SSDC) in 2016.
- SSDC composed by around 40 researchers.
- Management and organization led by ASI involving INFN and INAF
- Data Management of ASI and INFN missions
- Separated ASI funding for SSDC activities

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What's next?

- Fermi is expected to have a long life but many projects are coming in the future:
  - IXPE (Image X-ray Polarimeter Explorer)
  - HERD (High Energy cosmic Radiation Detection facility)
  - CTA (Cherenkov Telescope Array)
  - E-Astrogam/AMEGO (MeV telescope)
- ASI is promoting also in Space Weather National Center.
  - Solar Flares detected by satellite can play an important role

Thank you for the attention!