

European Network  
HEAPNet  
High Energy  
Astroparticle  
Physics Network

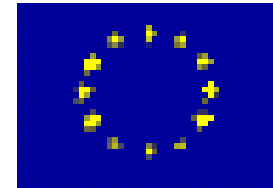
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INFN Roma 2

<http://crnet.in2p3.fr/plenary.html>



# THE EUROPEAN SIXTH FRAMEWORK PROGRAMME

The Sixth Framework Programme (FP6) covers Community activities in the field of research, technological development for the period 2002 to 2006



In the contest of FP6 , new **call for proposals:**  
INTEGRATING ACTIVITIES implemented as  
INTEGRATED INFRASTRUCTURE INITIATIVES (I3)

Structuring European Research Area  
Deadline 3 March 2005

# Requirements

An I3 (Integrated Infrastructure Initiatives ) requires 3 components:

- Networking (science driven)
- Joint Research Activities (JRA) (technology driven)
- Trans-national Access (TA) (support access to real and virtual research structures)

- The objectives of the *networking activities* will be expressed in terms of, e.g. a better co-operation among participants, better inter-operability of facilities, improved intercomparability of results, better connectivity (travel, exchanges, young researcher formation ...)
- The objectives for *transnational access* will be expressed in terms of providing adequate access to a number of infrastructures (real and/or virtual).
- The objective of a *joint research project* will be expressed in terms of, e.g. instrumentation development or other technical achievements. Specific deliverables will take the form of reports, publications, designs, prototypes, etc.

# High Energy Astroparticle Physics Network

## The HEAPNET proposal

### **Astroparticle Physics** basic physics motivations:

Obtain a coherent view of science questions concerning the Universe evolution mechanisms leading to the understanding of Cosmic Rays origin, composition, acceleration and propagation, and the possibility of explore New Physics phenomena beyond the EW scale

Necessity to correlate experimental and theoretical results involving different cosmic messenger :

- High Energy Gamma Rays
- Neutrinos
- Charged and Neutral Cosmic Rays

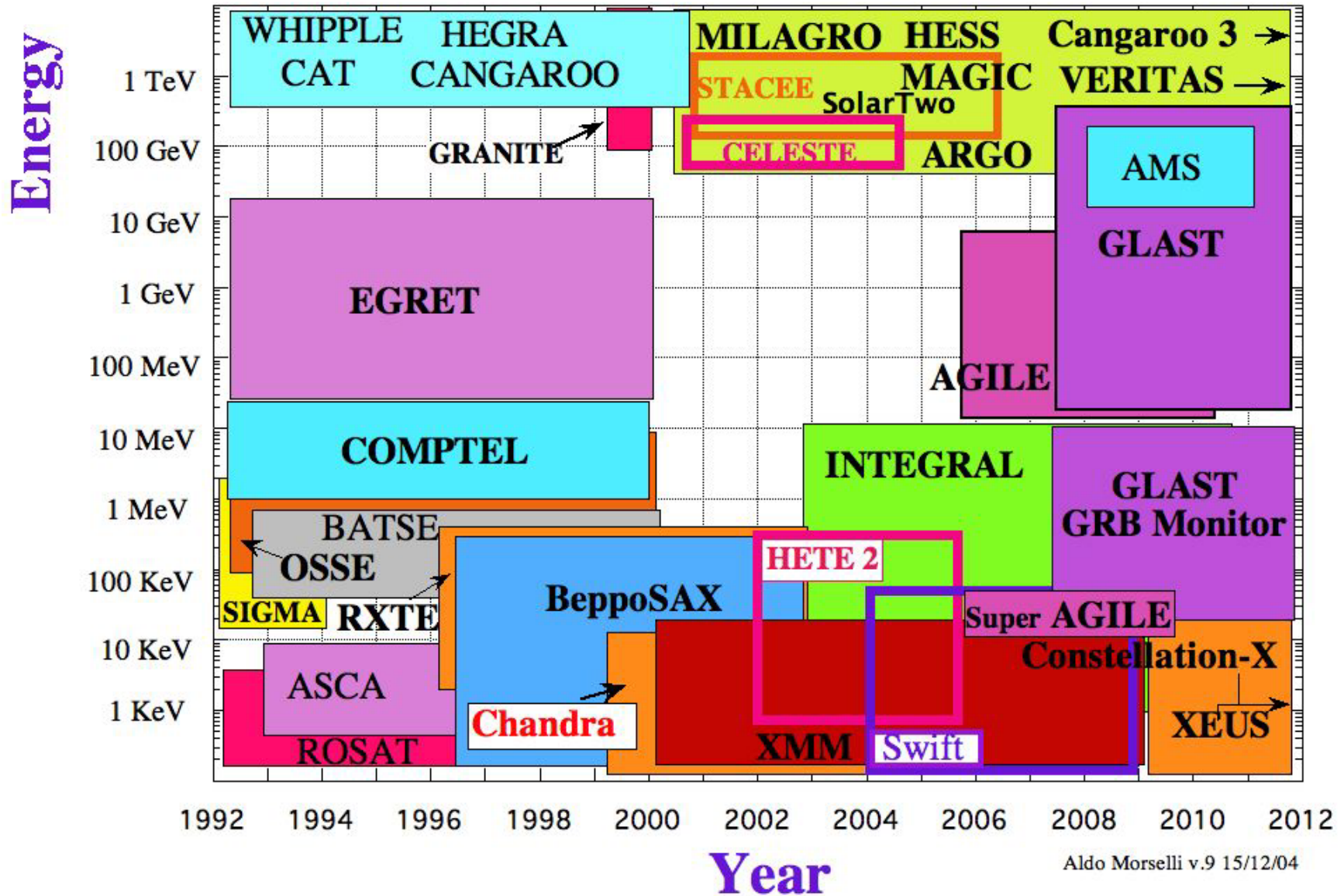
## Involved Community:

This European proposal concerns the following experiments and projects:

- Gamma Rays: AGILE, ARGO, AMS ( $\gamma$ ), GLAST, HESS, MAGIC, PAMELA( $\gamma$ );
- Neutrinos: AMANDA/ICECUBE, ANTARES, NEMO, NESTOR ;
- Cosmic Rays: AMS, AUGER, KASCADE-Grande, EUSO, PAMELA.

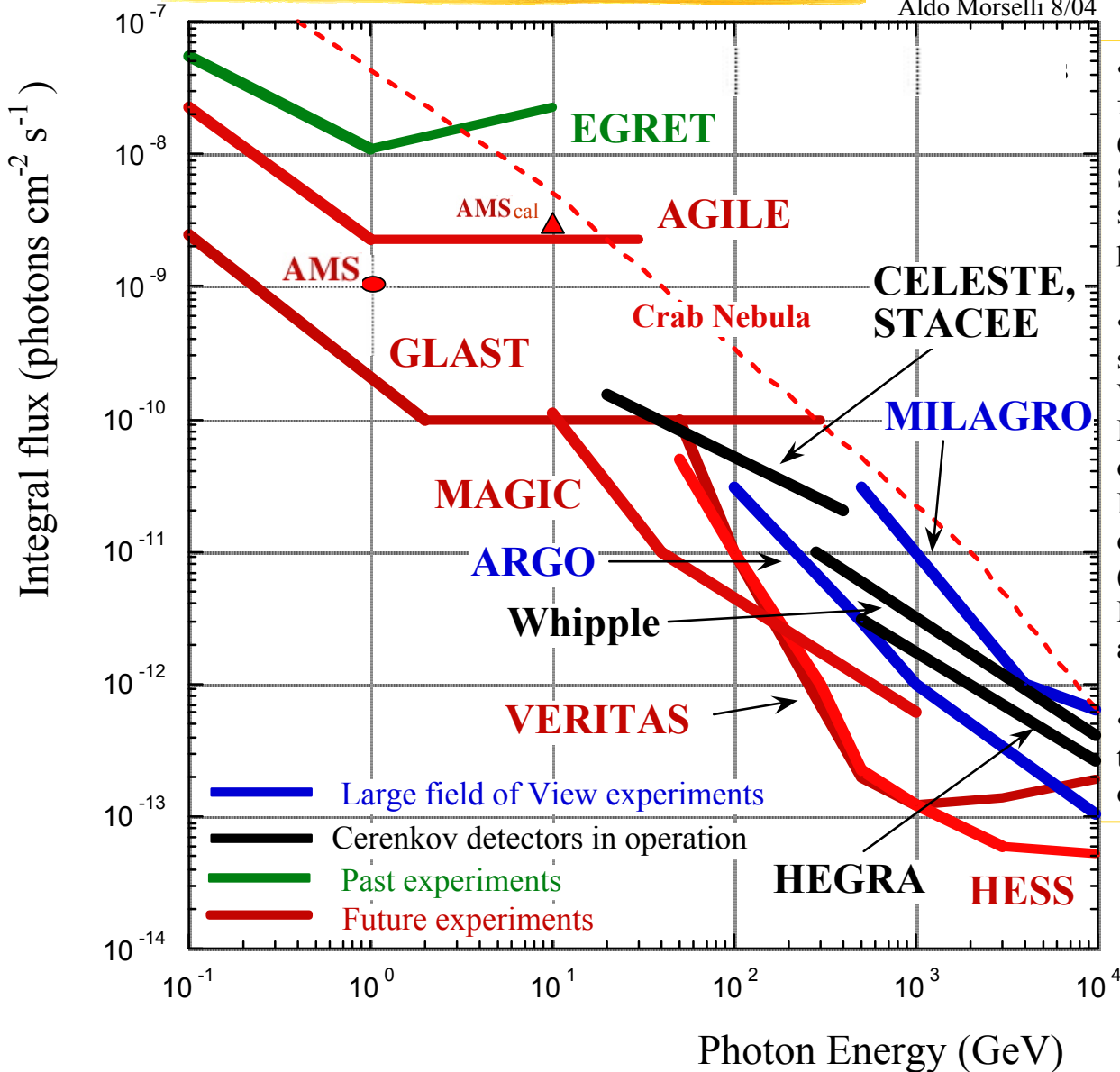
The understanding of the physics issues of this proposal requires a close collaboration between experimentalists and theoreticians.

# Energy versus time for X and Gamma ray detectors



# Sensitivity of $\gamma$ -ray detectors

Aldo Morselli 8/04



- All sensitivities are at  $5\sigma$  for a high latitude background ( $2 \cdot 10^{-5} \text{ ph cm}^{-2} \text{ sr}^{-1} (100 \text{ MeV/E})^{1.1}$ ) Source differential photon spectrum is assumed to have a power law index of -2.

- Cerenkov telescopes sensitivities (Veritas, MAGIC, Whipple, Hess, Celeste, Stacee, Hegra) are for 50 hours of observations.

- Large field of view detectors sensitivities (AGILE, GLAST, Milagro, ARGO, AMS) are for 1 year of observation.

- MAGIC sensitivity based on the availability of high efficiency PMT's



# The Gamma Ray part of the Proposal (*under construction*)

Areas of synergy :

Coordinate Gamma-Ray observations among themselves:

- Observation and measurement of gamma rays across many different energy ranges with ground and space based detectors

Correlate  $\gamma$  observations with  $\nu$  and CR observations.

## Objectives and expected impact:

- Observation and measurement of gamma rays across many different energy ranges with ground and space based detectors. Multi-wavelengths programs including X-rays (INTEGRAL, HESS, MAGIC, VERITAS).
- Correlate observations from southern and northern hemispheres (HESS and MAGIC, but also VERITAS) and space experiments.
- Combination of space (AGILE/GLAST/AMS) and ground observations (ARGO, HESS, MAGIC, VERITAS).
- Develop observation methods for transient sources: alert systems and combination of space (AGILE/GLAST/AMS) and ground observations (HESS, MAGIC).
- Evaluate potential discovery and physics outcome.

## Description of work:

Multiwavelength (MW) studies are intimately related to essentially all the astrophysical topics of gamma-ray astrophysics. All of the gamma-ray observations will require observational programs at other wavelengths to extract their full value.

We envision three types of multiwavelength study:

- i) identification of sources in known classes, such as blazars and pulsars,
- ii) discovery of new sources classes,
- iii) intensive, MW explorations of the brightest and most variable sources that will allow deep study of the source physics.

## Milestones:

*after 18 months :*

- i) Definition of a Coordination between ground and space gamma ray observatories
- ii) Definition of a Coordination between existing MW programs, such as WEBT, ENIGMA, REM, and space and ground gamma-ray observations.

# Transnational Access (TA)

Access to and exchange of data, e.g.:

- a ( web-based) database of astro-particle observations and the exchange of inter disciplinary data
- sharing of Computer modeling and simulations

Writing groups for the new Proposal  
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**Feedback expected:** we encourage suggestions, comments,  
proposals from the Gamma-Ray Community

Next HEAPNET Plenary Meeting:

ROMA February 11 2005  
Centro Congressi - Università di Roma "La Sapienza"