very very final remarks

Aldo Morselli
RICAP 2009
very timely conference

• ~ 3 years from PAMELA launch

• Launched in orbit on June 15, 2006, on board of the DK1 satellite by a Soyuz rocket from the Bajkonour cosmodrom.
RICAP 2009

~ 2 years from AGILE launch

Perfect launch of the AGILE satellite by ISRO from the SHAR base (Chennai), India,

April 23, 2007
~ 1 year from Fermi launch

11 June 2008
• no new launch this year?
14 May 2009
Plank launch!
Fermi PAMELA and LHC WIMP Detection Sensitivity

A. Morselli, I. Moskalenko arXiv:0811.3526

Fermi sensitivity in five years for a Navarro Frank and White (NFW) halo profile

Ricap 09, 14 -05, 2009

Aldo Morselli, INFN Roma Tor Vergata
The Haze Spectrum

- Looks like synchrotron but with a very hard spectrum, $E^2 dN/dE \propto E^\alpha$, $-0.1 \leq \alpha \leq 0.2$

- If it is synchrotron, it requires
  - hard $e^+e^-$ spectrum
  - extended emission

- Very difficult to produce astrophysically

Ricap 09, 14-05, 2009

Aldo Morselli, INFN Roma Tor Vergata
The Haze Spectrum

• WIMP annihilations may produce gamma rays
• WIMP annihilations also produce $e^+e^-$ (cosmic ray electrons)

The Haze: an explanation
WIMP annihilation produces very energetic electrons (>50 GeV)
• Halo annihilation towards the GC is extended injection (i.e., not a point source)

Galactic/baryon parameters:
– Magnetic field, $B = 10 \mu$G
– Diffusion constant, $K(E) \sim 10^{28} \text{cm}^2/\text{s}$

• Dark matter parameters
– DM halo profile, $\rho = \rho(r) \sim r^{-1.2}$ favored
– WIMP mass, $M \sim 100$-800 GeV
– Annihilation cross section, $\langle \sigma v \rangle \sim 3 \times 10^{-26} \text{cm}^3/\text{s}$
– Annihilation mechanisms ($W^+W^-$, ZZ, bb, etc.)
many thanks to everybody

many thanks to all the speakers
stasera ti aspetto fino a tardi.

LA notte dei musei
16 MAGGIO '09
INGRESSO GRATUITO

from 8 pm to 2 am
50 museums, free entrance

http://www.museiincomuneroma.it

Tor Vergata
Underground, Under-ice, Underwater

Extensive Air Shower Detectors

Direct detection

Cosmic rays: about 10 Myears in the Galaxy (6-7 g/cm²)

23 Xo

Cosmic Rays

Propagation

Modulation

further acceleration?

creation acceleration injection

High Mountain Detectors

Cherenukov Detectors

Particle Accelerators

Particle Astrophysics Experiments

ARGO-JBJ Milagro

Fermi
PAMELA
AGILE
AMS

KASCADE Grande
DECOR
AUGER

NEMO
ANTARES
IceCube

MAGIC
HESS

Space experiments ~ 400 km

Balloons ~ 40 km

~3 g/cm² residual atmosphere

Extensive Air Shower Detectors
All of you are invited to the third edition of RICAP in 2011 that will be hosted in INFN & Roma TRE University
thank you for your participation!

Ricap 09, 14-05, 2009

Aldo Morselli, INFN Roma Tor Vergata