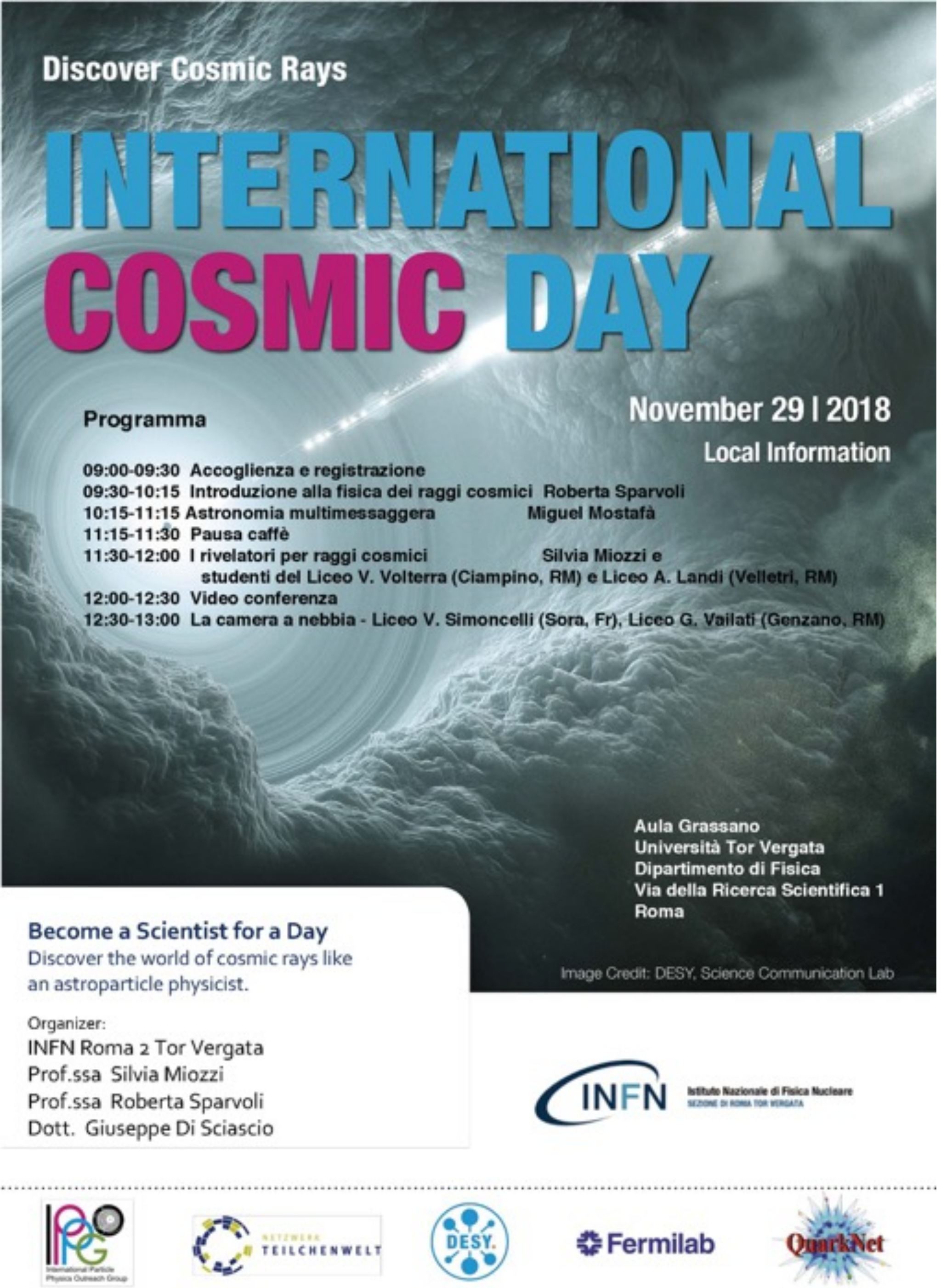
Sez INFN Roma Tor Vergata



Discover Cosmic Rays

INTERNATIONAL COSMIC DAY

November 29 I 2018

Local Information

Programma

09:00-09:30 Accoglienza e registrazione
09:30-10:15 Introduzione alla fisica dei raggi cosmici Roberta Sparvoli
10:15-11:15 Astronomia multimessaggera Miguel Mostafà
11:15-11:30 Pausa caffè
11:30-12:00 I rivelatori per raggi cosmici Silvia Miozzi e studenti del Liceo V. Volterra (Ciampino, RM) e Liceo A. Landi (Velletri, RM)
12:00-12:30 Video conferenza
12:30-13:00 La camera a nebbia - Liceo V. Simoncelli (Sora, Fr), Liceo G. Vailati (Genzano, RM)

Aula Grassano
Università Tor Vergata
Dipartimento di Fisica
Via della Ricerca Scientifica 1
Roma

Image Credit: DESY, Science Communication Lab

Become a Scientist for a Day

Discover the world of cosmic rays like an astroparticle physicist.

Organizer:
INFN Roma 2 Tor Vergata
Prof.ssa Silvia Miozzi
Prof.ssa Roberta Sparvoli
Dott. Giuseppe Di Sciascio

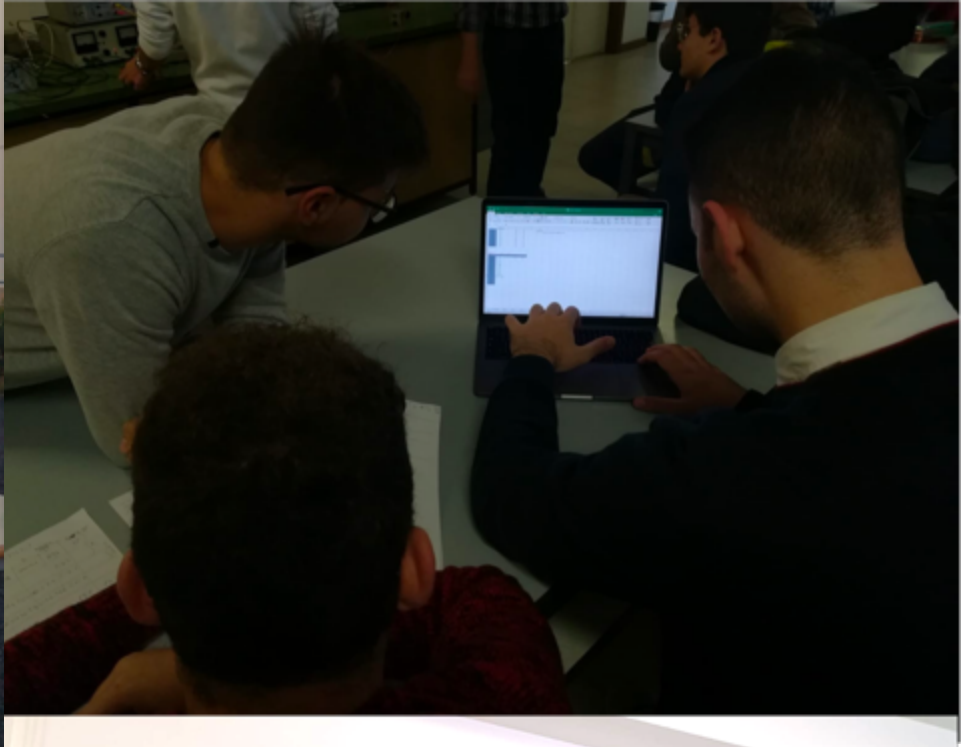
Liceo scientifico Volterra, Ciampino (RM)
Liceo scientifico Landi, Velletri (RM)
Liceo classico Simoncelli, Sora (FR)
Liceo scientifico Vailati, Genzano (RM)
Liceo scientifico Pasteur (RM)
Liceo scientifico Sulpicio, Veroli (FR)

83 studenti + 7 insegnanti

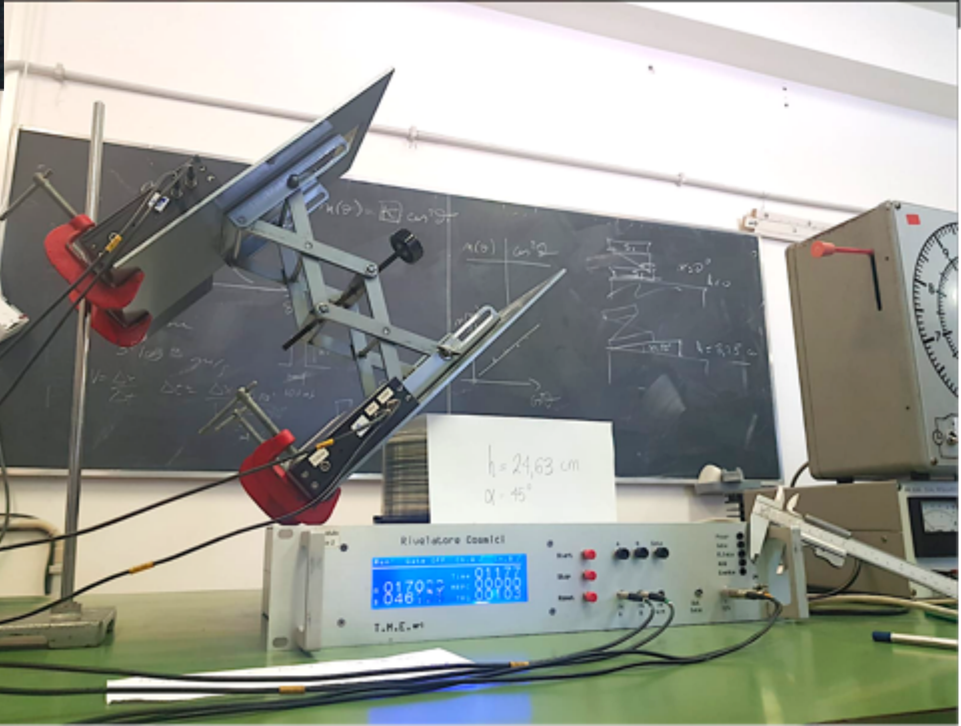
Meeting OCRA, 17/12/2018
Silvia Miozzi

Prima dell’ICD e presso le scuole

Superficie Utile
Superficie Utile



- La fisica dei raggi cosmici
- I rivelatori per raggi cosmici
- Misure
- Analisi dati


h = 24,63 cm
α = 45°
Rivelatore Cosmici
T.M.E.

CAMERA A NEBBIA A DIFFUSIONE

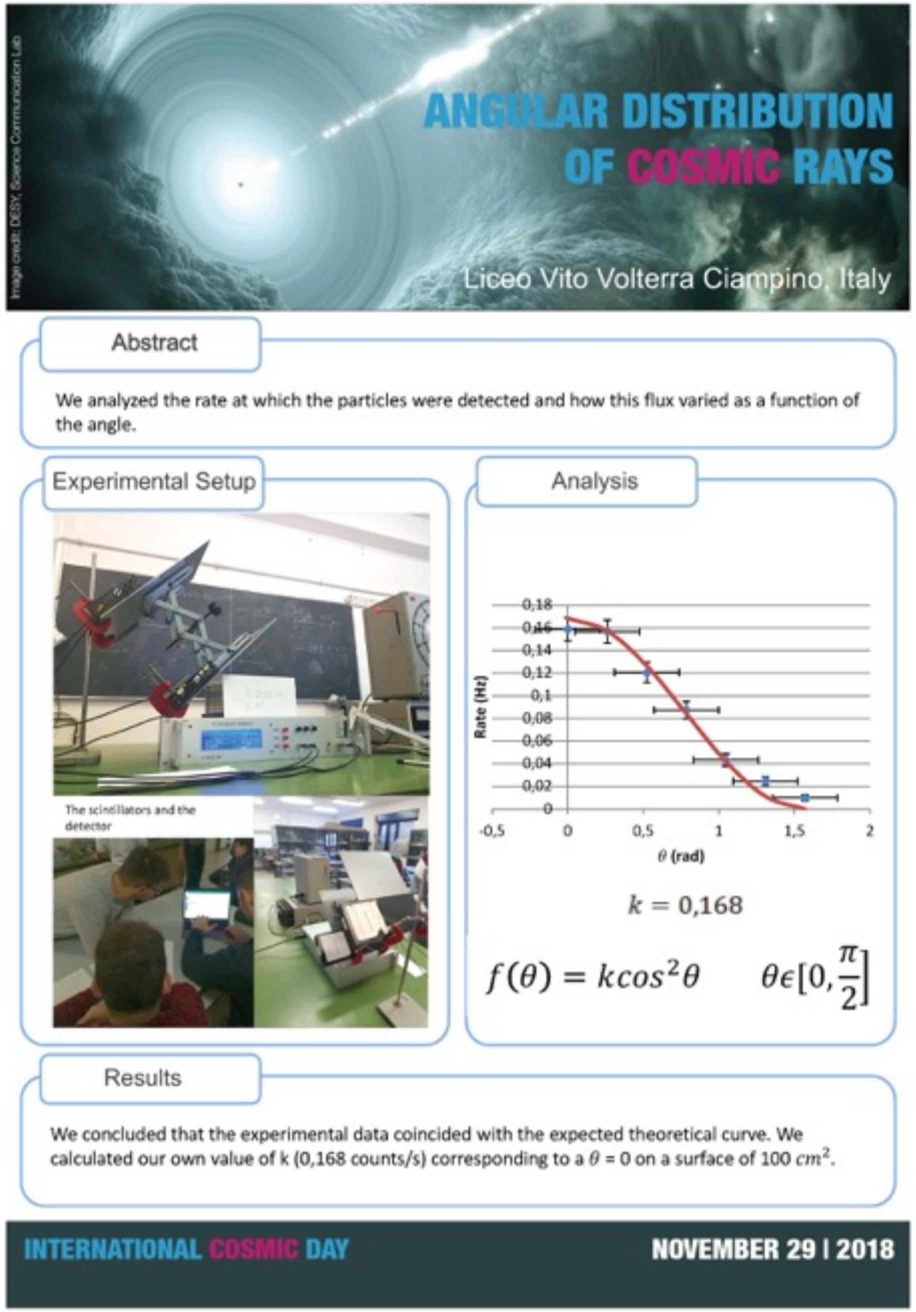


Image credit: DESY, Science Communication Lab

ANGULAR DISTRIBUTION OF COSMIC RAYS

Liceo Vito Volterra Ciampino, Italy

Abstract

We analyzed the rate at which the particles were detected and how this flux varied as a function of the angle.

Experimental Setup

The scintillators and the detector

Analysis

0,18
0,16
0,14
0,12
0,1
0,08
0,06
0,04
0,02
0
Rate (Hz)
-0,5
0
0,5
1
1,5
2
θ (rad)

$$k = 0{,}168$$

$$f(\theta) = k\cos^2\theta \qquad \theta \epsilon [0, \frac{\pi}{2}]$$

Results

We concluded that the experimental data coincided with the expected theoretical curve. We calculated our own value of k (0,168 counts/s) corresponding to a $\theta = 0$ on a surface of 100 cm^2.

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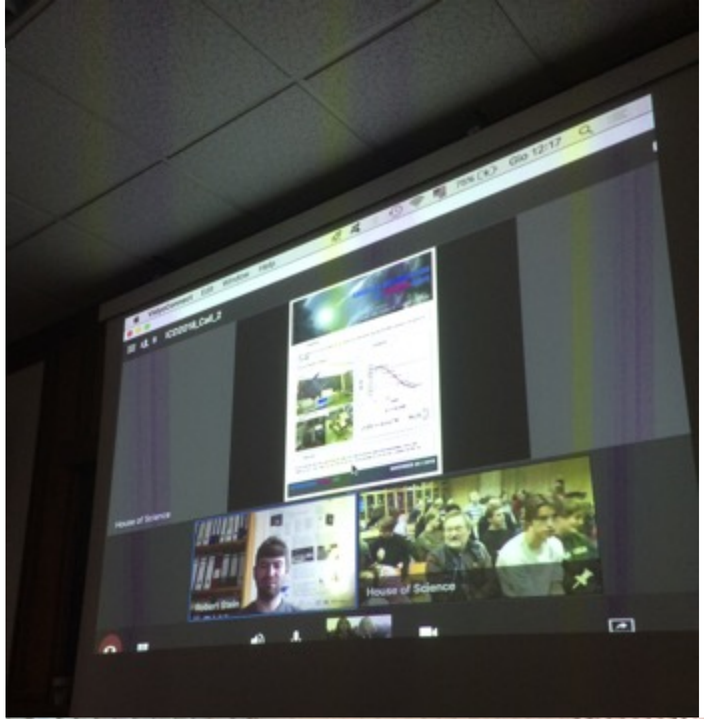

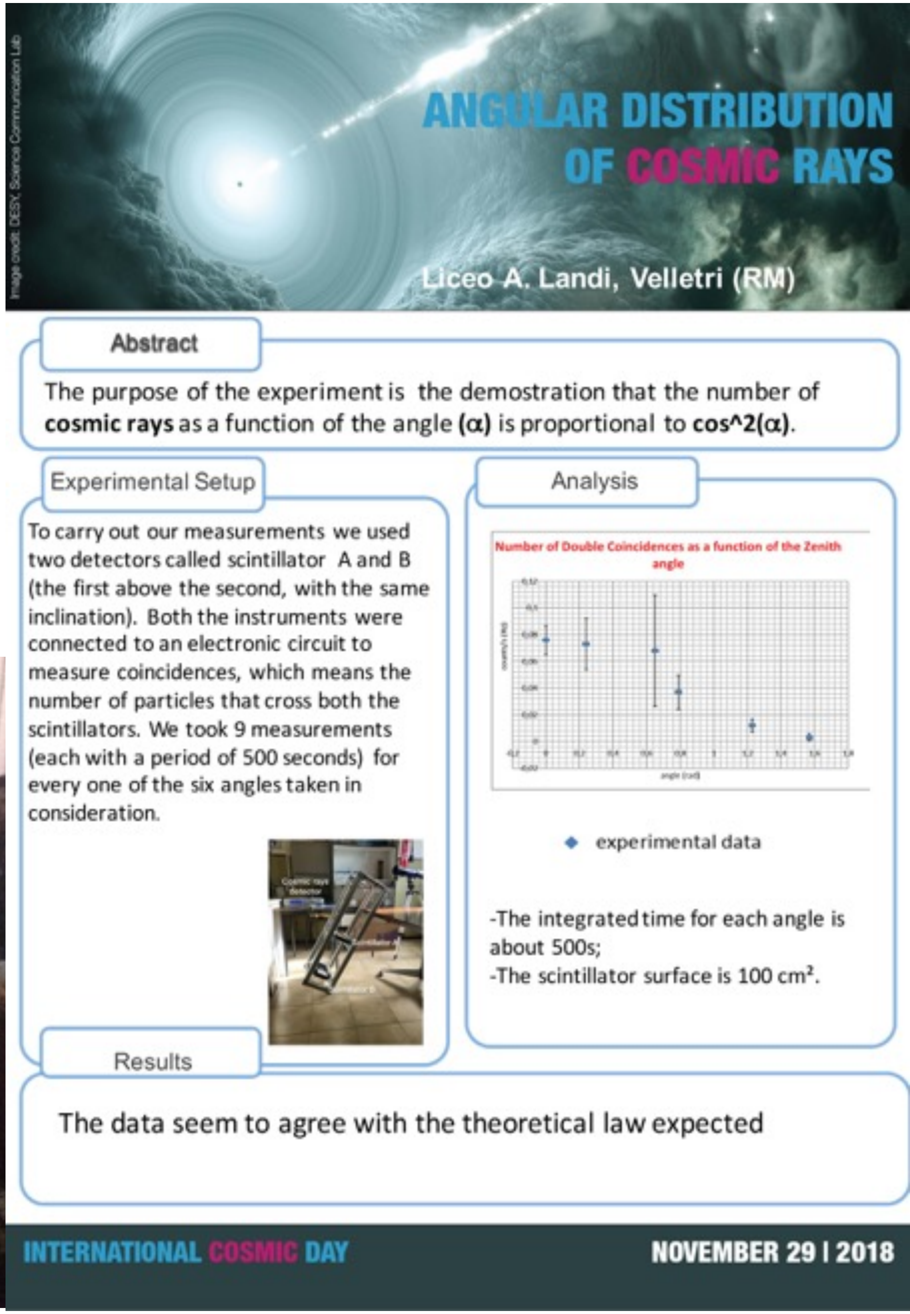
Image credit: DESY, Science Communication Lab

ANGULAR DISTRIBUTION OF COSMIC RAYS

Liceo A. Landi, Velletri (RM)

Abstract

The purpose of the experiment is the demostration that the number of **cosmic rays** as a function of the angle **(α)** is proportional to **cos^2(α)**.

Experimental Setup

To carry out our measurements we used two detectors called scintillator A and B (the first above the second, with the same inclination). Both the instruments were connected to an electronic circuit to measure coincidences, which means the number of particles that cross both the scintillators. We took 9 measurements (each with a period of 500 seconds) for every one of the six angles taken in consideration.

Analysis

Number of Double Coincidences as a function of the Zenith angle
angle (rad)
◆ experimental data

-The integrated time for each angle is about 500s;
-The scintillator surface is 100 cm².

Results

The data seem to agree with the theoretical law expected

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Punti di forza

- Coinvolgimento degli studenti prima dell'evento
- Collaborazione tra scuole

Criticità

- Necessità di avere più rivelatori
- Aula più grande