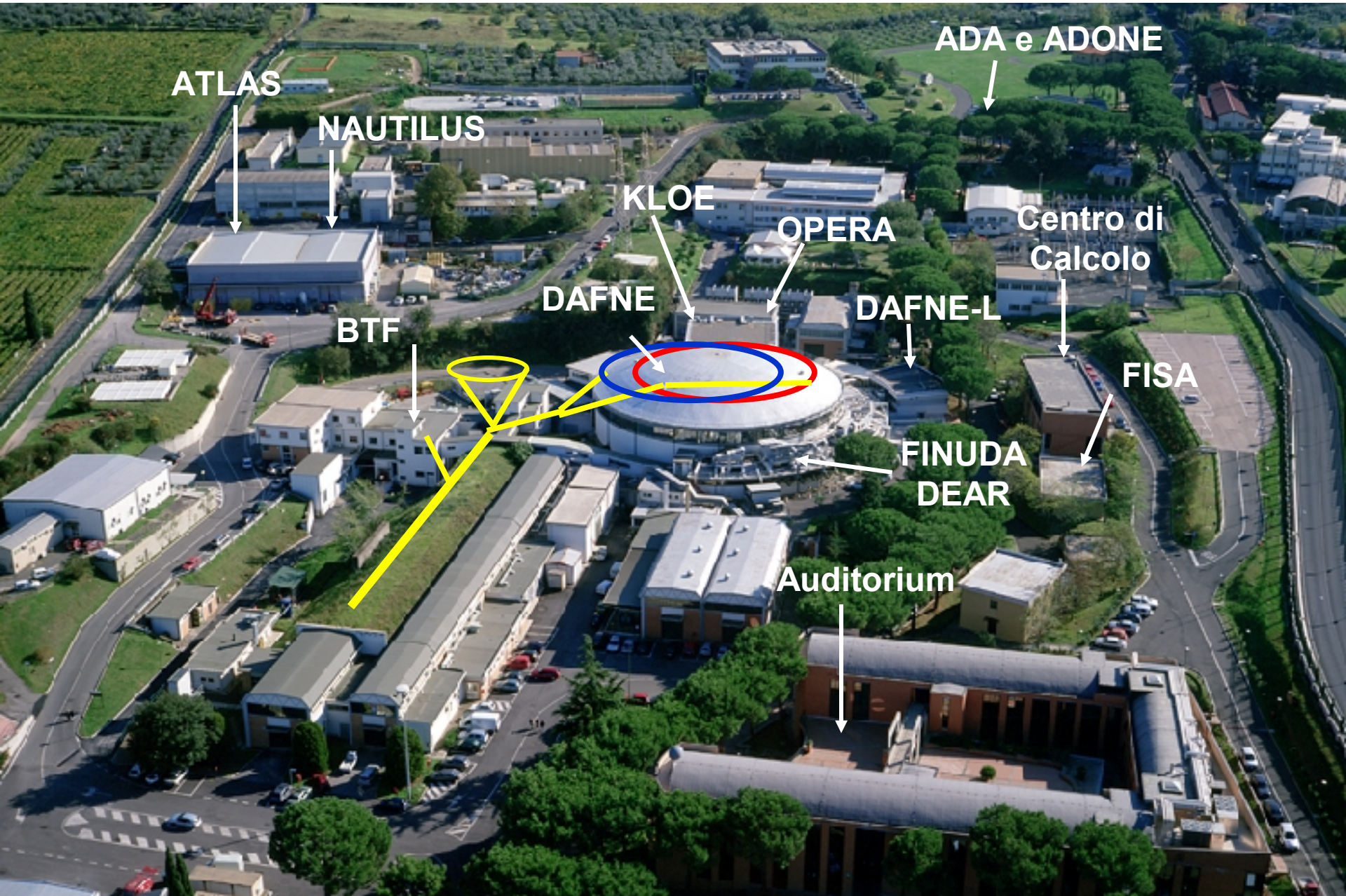




Far fare fisica: l'esperienza dei Laboratori Nazionali di Frascati

Catalina Curceanu (Petrascu)
CF07 Trieste, 5 settembre 2007

Laboratori Nazionali di Frascati, info:
<http://www.Inf.infn.it/sis/>



Frascati National Labs (LNF)

- **368 people on staff**
 - ✓ **98 Researchers**
 - ✓ **62 Engineers**
 - ✓ **167 Technicians**
 - ✓ **41 Services + Admin.**
 - **400 external users on average**
 - **25 M euro yearly turnaround (no personnel costs)**
 - **15 Master + 10 Ph.D. theses/year**
-



Alcuni esempi di attivita'

- **Stages**
 - **Visite**
 - **Masterclass**
 - **Quasar**

 - **CRESCERE – FP6 Europe**
 - **Tante altre attivita' (EEE, radioattivita' ambientale, formazione, Researchers' Night.....)**
-

Stages

Gli studenti, selezionati dai loro docenti in base al curriculum scolastico, alle attitudini e motivazioni personali, vengono inseriti nelle attività di ricerca dei Laboratori.

Trascorrono un periodo con i gruppi sperimentali che hanno dato la propria disponibilità, imparando a conoscere le metodologie di lavoro proprie del mondo della ricerca ed ad usare tecniche e strumentazioni sotto la guida di ricercatori e tecnici.

s t u d e n t s
a g e s **infn-1nf**

Stages

Gli argomenti degli stages sono proposti in base al programma didattico svolto dai docenti scolastici che ne seguono l'andamento insieme ai tutori LNF.

Al termine degli stages, gli studenti elaborano e pubblicano sulla pagina WEB dei LNF, le loro relazioni negli argomenti scelti e i LNF rilasciano un attestato di frequenza con scheda di valutazione.

Indirizzi stages: Elettronica, Informatica, Meccanica, Rivelatori e Fisica Ambientale

Indirizzi percorsi formativi: Particelle elementari, Teoria della Relatività, Le grandi idee della fisica moderna, Cosmologia e Radioprotezione.



CARROPONTE
IN
MOVIMENTO

ATTENZIONE
AL CARICO













Stages estivi
11-06-2007

Viste

Visite (~3000 studenti/anno) ai LNF:

- Presentazione attivita' (fisica moderna)
- Vistite alle attivita' LNF (acceleratore DAFNE, esperimenti)





Masterclass

Attività' nell'ambito della fisica moderna (livello Europeo) – studenti selezionati (~40 studenti di tutta l'Italia):

- Corsi di fisica moderna
- Analisi dati esperimenti fisica moderna (CERN, KLOE...)
- Integrazione e lavoro in squadra







Quasar

Attività' per i piu' piccoli (~10-12 anni):

-Visite e lezioni nelle scuole

-Visita ai LNF (presentazione attività' dedicata e visite agli esperimenti)

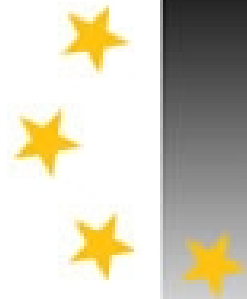




Crescere



CRESCERE



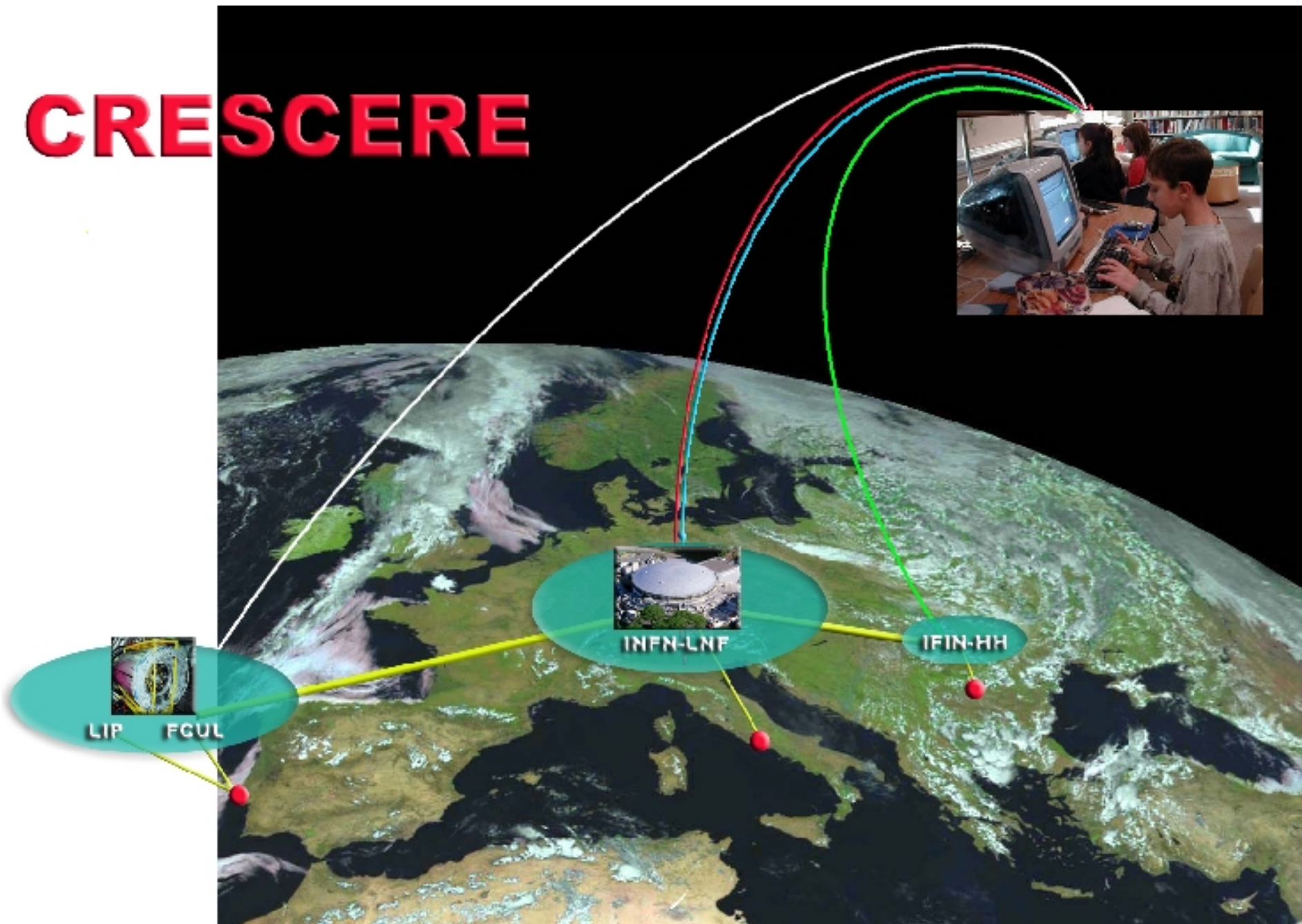
Scienziato anche tu

CRESCERE

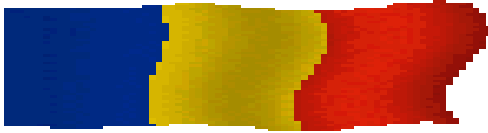
Cosmic Rays in an European SChool Environment: a Remote Experiment

***piu' di 200 scuole!!!
2005***

CRESCERE



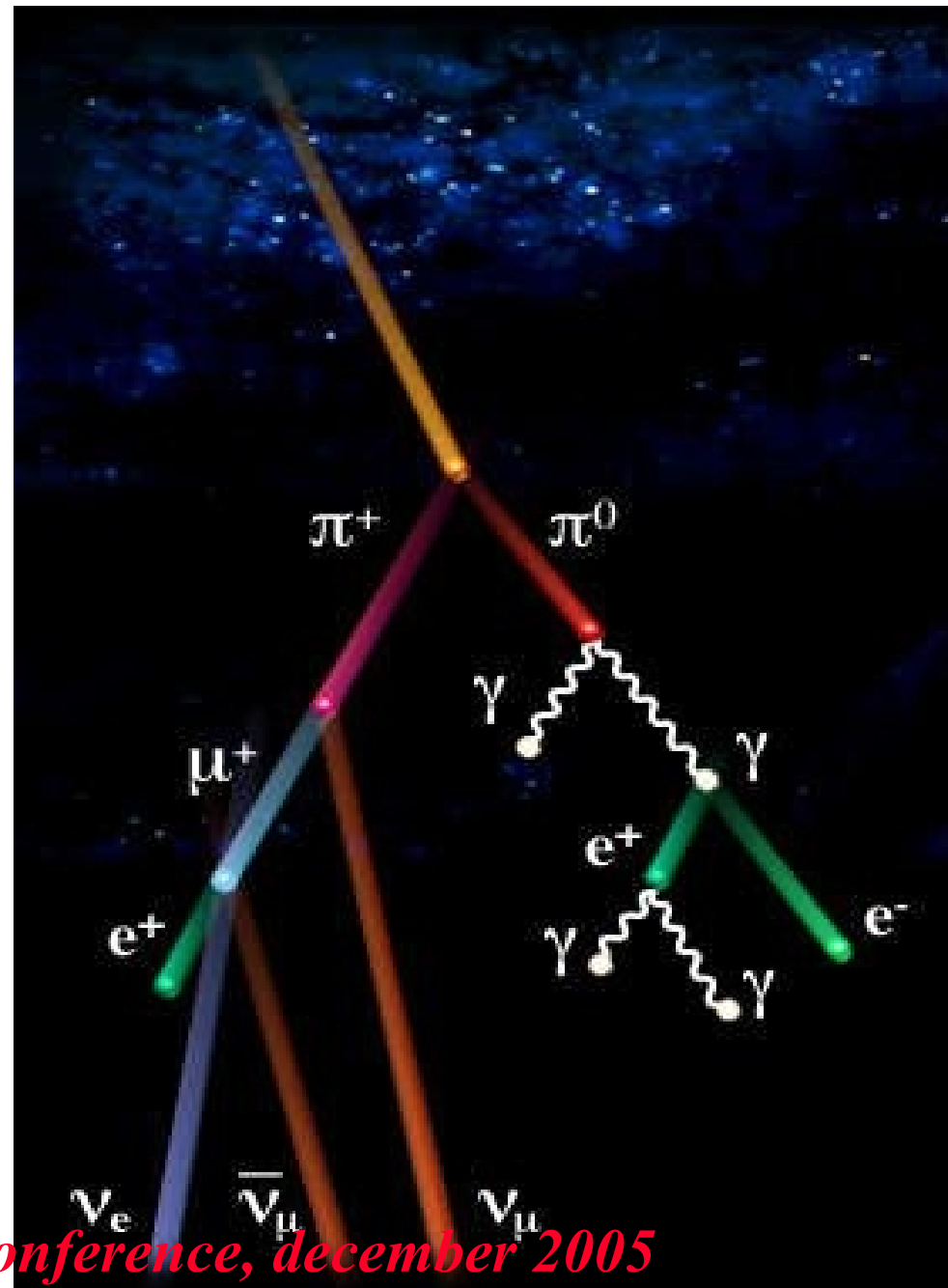
Mihai-Viteazul High School (Romania)



The team:
Anca,
Anda,
Aralda,
Adriana,
Alin,
Bogdan,
Cristi,
Bogdan,
Adriana,
Oana,
Laurentiu,
Stefi
coordinated
by prof.
Luminita
Curceanu...

The aim of the experiment is to determine the velocity of cosmic rays, which are particles coming from every corner of the Universe, and generating a shower of many other particles that eventually reach the Earth's surface. The most numerous of the latter are called "muons" which have the same electric charge as the electron but are 210 times heavier.

The so-called shower forms due to the very high energy of the initial particle.



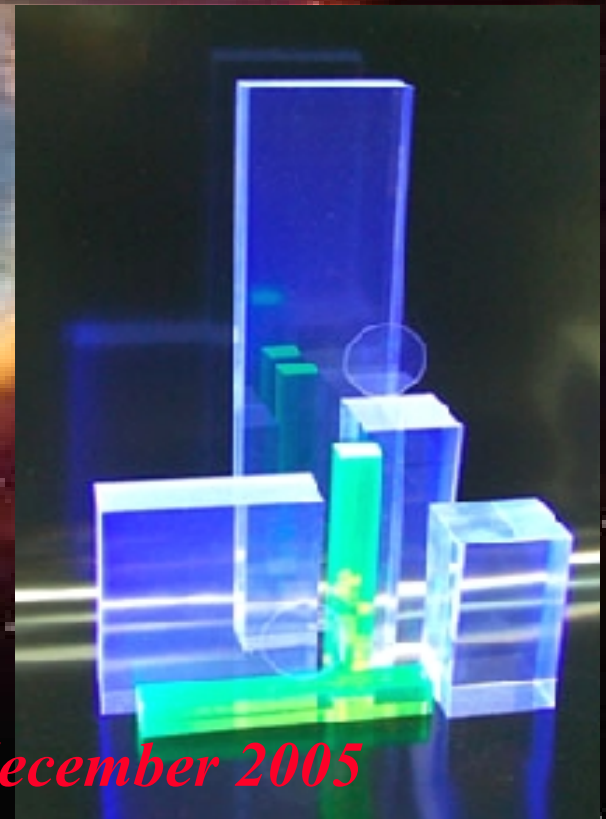
Lisbon CRESCERE conference, december 2005

Mihai-Viteazul High School (Romania)

In order to perform this measurement used the experimental setup made available by Laboratori Nazionali di Fisica dell'INFN of Frascati, Italy. The setup is composed of:

- two scintillation detectors, each made up of one scintillator, a light guide and a photomultiplier, the detectors being placed at various distances from one another;
- a particle counter;
- a discriminator;
- a time digital converter;

All of the above are linked to a PC where the data is analyzed and where the data files are created. These files are processed by the following software: Microsoft Word, for text editing, LabView 6.1, for data acquisition, OriginLab, for chart elaboration, and Internet Explorer.



Lisbon CRESCERE conference, december 2005

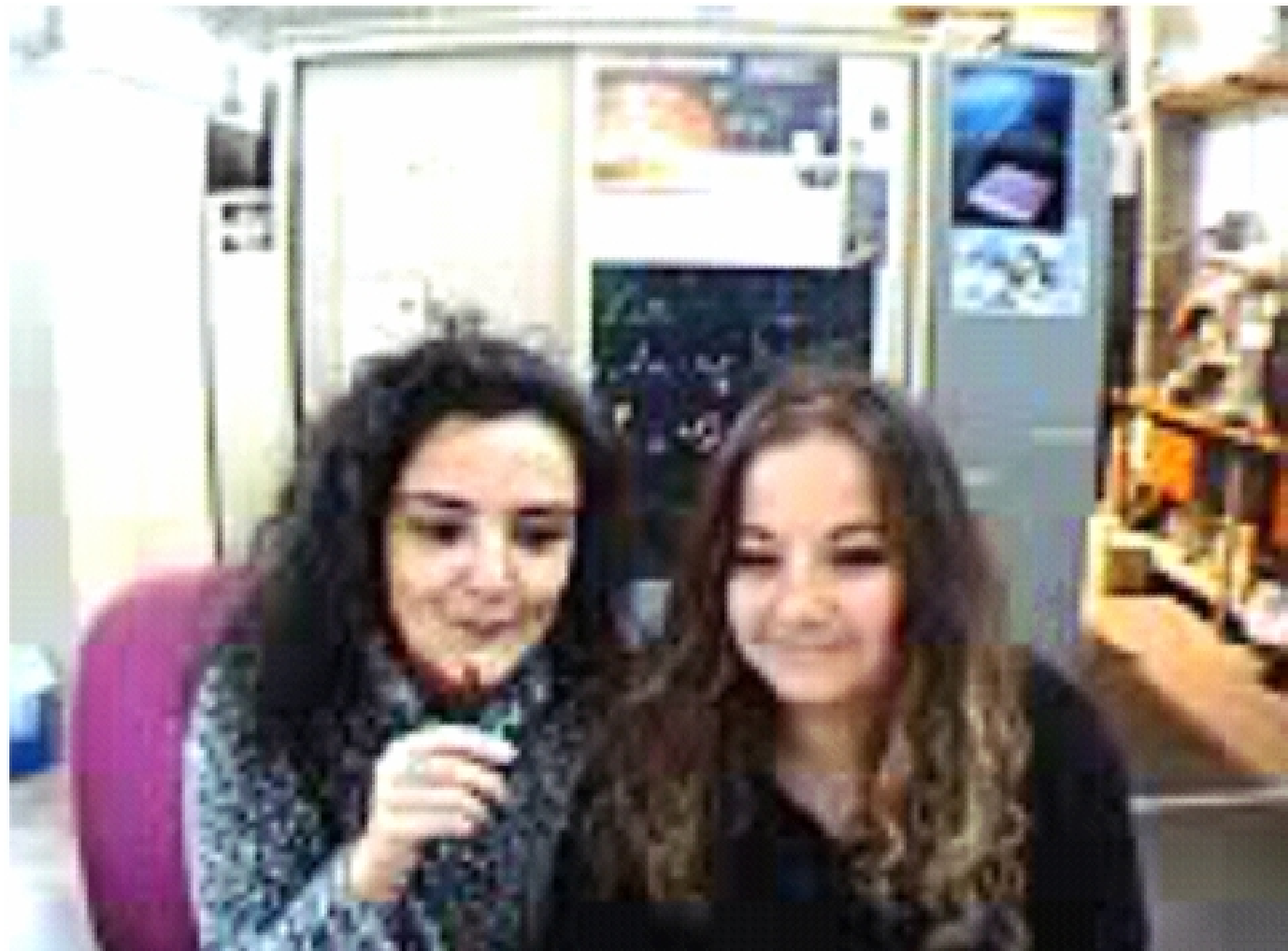
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CRESCERE Detector Ai LNF

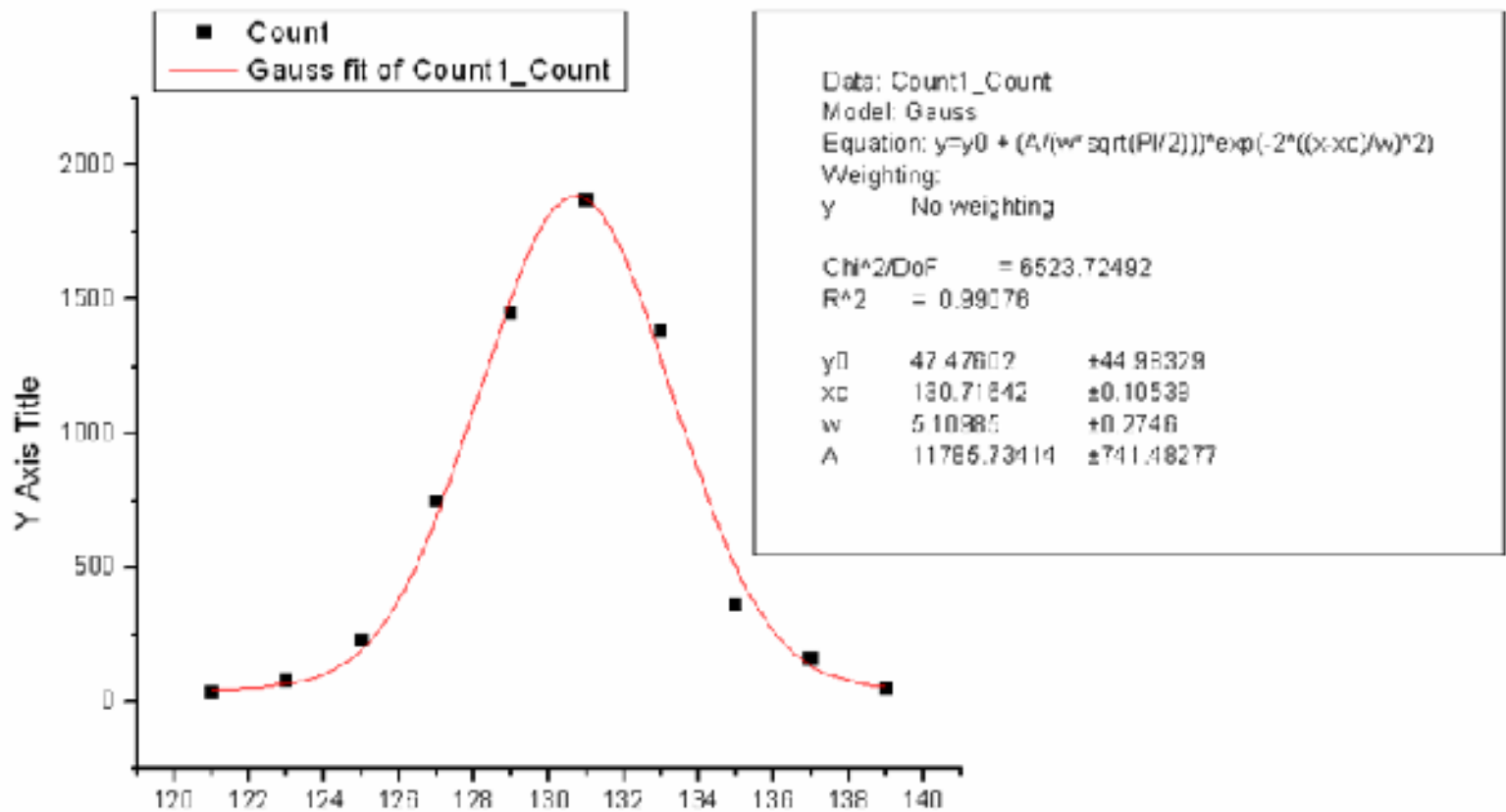
(A.Russo
e D.Pierluigi)







as shown in the chart:



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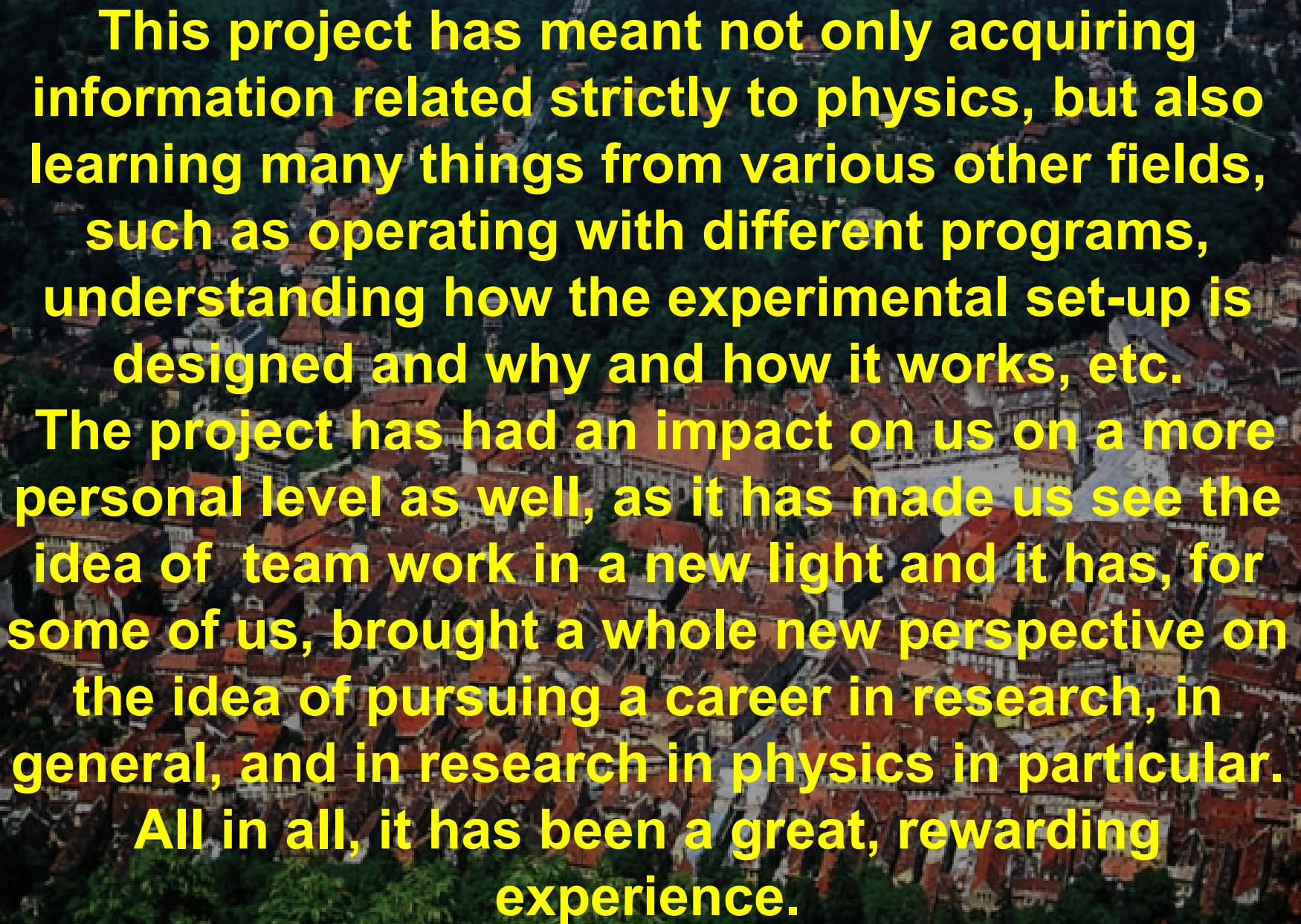


From these formulas, we
obtained the value of the velocity:

$$v = 2.86077 \pm 0.02345 \cdot 10^8 \text{ m/s}$$

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An aerial photograph of a city, likely Lisbon, showing a dense cluster of buildings with red-tiled roofs. The city is surrounded by green hills and trees. The text is overlaid on this image.

This project has meant not only acquiring information related strictly to physics, but also learning many things from various other fields, such as operating with different programs, understanding how the experimental set-up is designed and why and how it works, etc. The project has had an impact on us on a more personal level as well, as it has made us see the idea of team work in a new light and it has, for some of us, brought a whole new perspective on the idea of pursuing a career in research, in general, and in research in physics in particular. All in all, it has been a great, rewarding experience.

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**Al posto della conclusioni
Un ragazzo di 10 anni durante
la visita ai LNF**

