



# Geophysics on stage: bringing Earth into scene

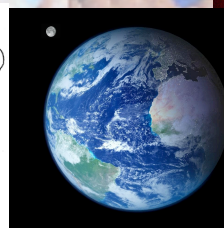
The INGV science theatre experiences

Tiziana Lanza<sup>1</sup>, Massimo Crescimbene<sup>1</sup>, Federica La Longa<sup>1</sup>, Enrico Pizzicannella<sup>2</sup>,  
Giacomo Tortorici<sup>2</sup>, Luca Pizzino<sup>1</sup>, Alberto Frepoli<sup>1</sup>, Giuliana D'Addezio<sup>1</sup>

1 Laboratorio di Didattica e Divulgazione Scientifica INGV – Roma

2 Ente Parco dei Castelli Romani – Rocca di Papa

*We do believe in education!*





*“All the world is a stage. And all the men and women merely actors”*

W. Shakespeare - As you like it

“Il teatro ha origini molto lontane. E’ una tecnica di svelamento che la sapienza egiziana già possedeva. Il teatro è vita in economia”

Leo de Bernardinis



Since September 2008 the  
Laboratorio di didattica e  
Divulgazione Scientifica (INGV –  
Rome) has started to experiment  
science theatre as an innovative tool  
to promote seismic risk awareness  
and Earth education





Up to now we implemented two projects:

1 - Readapting of an ancient Sicilian myth, Colapesce, to be performed in a school theatre by pupils aged 6-10 ys (II-IV Primary School F.Di Donato in Rome).

2 - A pilot project developed in collaboration with Ente Parco dei Castelli Romani and with the help of students aged 16 (Classical Lyceum III A and B, Socio-Pedagogical Lyceum F of Mancinelli&Falconi Institute in Velletri) concerning the possibility to establish in the future an Ecomuseum in one of the Lazio Region areas rich of natural landscapes and history.





**Science can be conveyed via narratives and this represents a reliable way to transmit scientific contents to people. An evaluation has been done in a school context with encouraging results (Negrete&Lartigue 2010)**

**Also Myths and Legends are a type of narratives and have a structure familiar to most people. They are particularly precious for Earth education. Early human civilizations used myths to organize and convey information for transmitting the wisdom necessary to live in harmony with and survey in nature (Lanza&Negrete 2007)**

[An excerpt from Apocalypto - A story from a wise village elder](#)

*"The greatness of a nation and its moral progress can be judged by the way its animals are treated." - Mahatma Gandhi*

*Geophysics on stage...Lanza T. et al. [Tiziana.Lanza@ingv.it](mailto:Tiziana.Lanza@ingv.it)*





*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*





# Once upon a time a fisherman...

Sept 2008 - March 2009

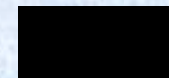


## Participants:

II Primary school:  
(pupils aged 6-8)

IV Primary school:  
(pupils aged 8-10)

***XIX Week of the  
Scientific Culture  
27 March 2009***





# One upon a time...



Renato Guttuso The Legend of Colapesce – Volta del Teatro Vittorio Emanuele II – Messina Sicily

*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*







# The script: highlights



We readapted the story to include a modern scientific content acted by the IV primary school pupils (9-10 ys ) starring INGV seismologists



Little fairies allow scientists to go back in time....



A seismometer was part of the plot and brought into scene by the young scientists who discussed about it with the legendary King of the Colapesce Fairy tale who believed it was a bomb!





## Evaluation

The evaluation process aimed at verifying:

- if the project promoted the seismic risk knowledge
- And encouraged the acquisition of individual and social behaviour for risk preparedness





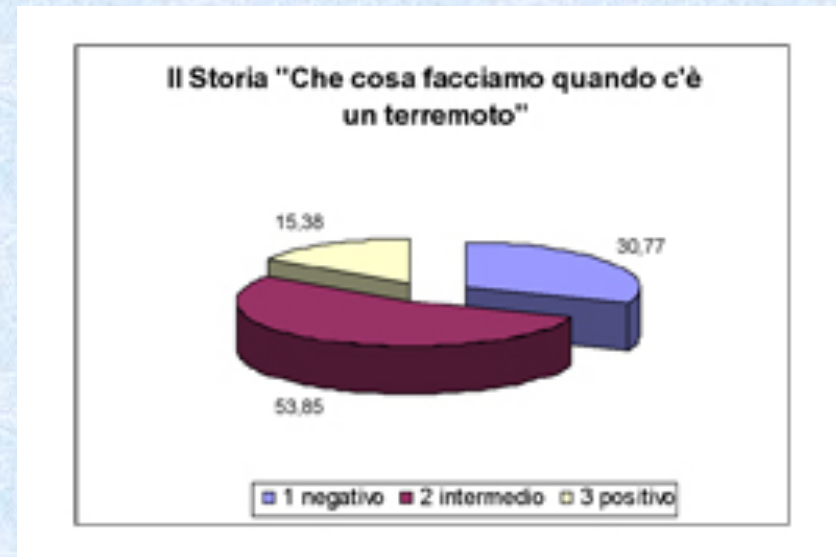
# Evaluation tools

- 1 Duss Fairy tale test (adopted for the 6/7 ys schoolmates)
- 2 Semi-structured questionnaire on the Colapesce story (for the 9/10 ys schoolmates)
- 3 An open form for the teachers' evaluation of the whole experience





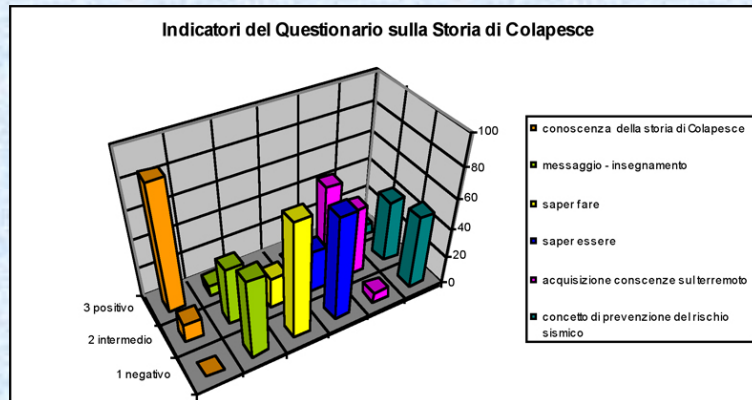
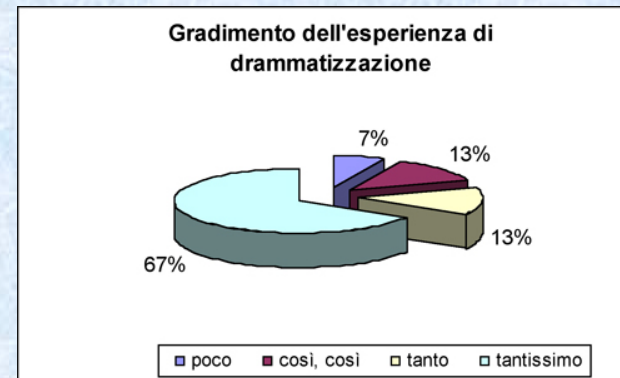
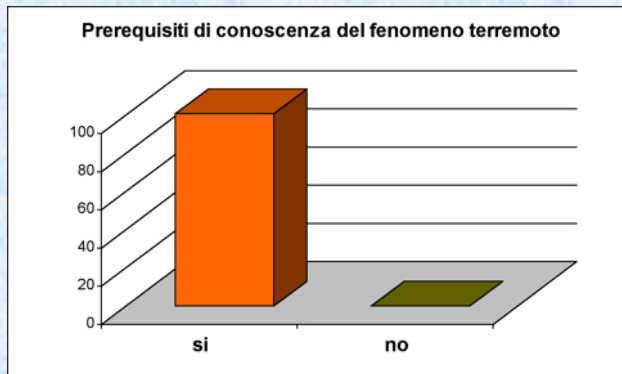
# Results 1 II class students



We note that the graph concerning the group collaboration presents the highest negative scores



## Results 2 IV class students



We note that the 93 per cent of the students have a good seismic knowledge, while only the 7 per cent seems to have acquired a seismic risk awareness



## Results 3 -Teachers'evaluation

The teachers gave a positive feedback about the whole experience as an efficacious way to transmit scientific content but suggested to involve more the children in the script writing and in the setting. The IV primary students have reinforced their knowledge about earthquakes thanks to the experience of dramatisation





## Towards a Castelli Romani Ecomuseum

Oct 2009 – May 2010



### Participants:

Classical  
Lyceum III A:  
in charge of the  
performance

Socio  
Pedagogical  
Lyceum III F: In  
charge of the  
Evaluation

Classical  
Lyceum III B:  
checking group

*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*





# The Ecomuseum

Is a museum without walls that focuses on the identity of a place, it is based on local participation and refers to a new idea of it that involves the whole cultural heritage in opposition to the focus on specific items and objects, performed by traditional museums

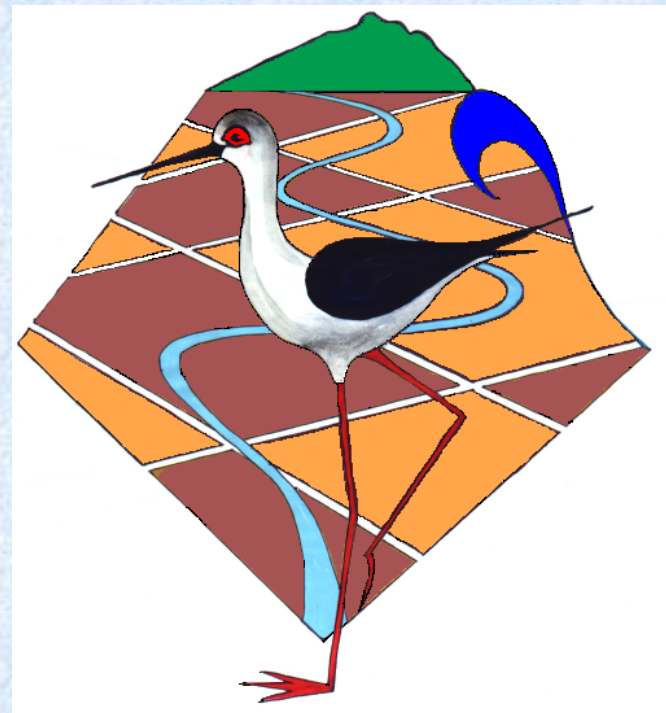
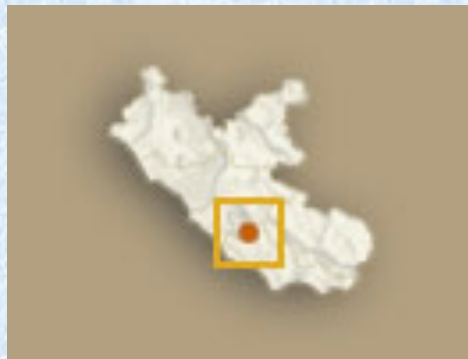




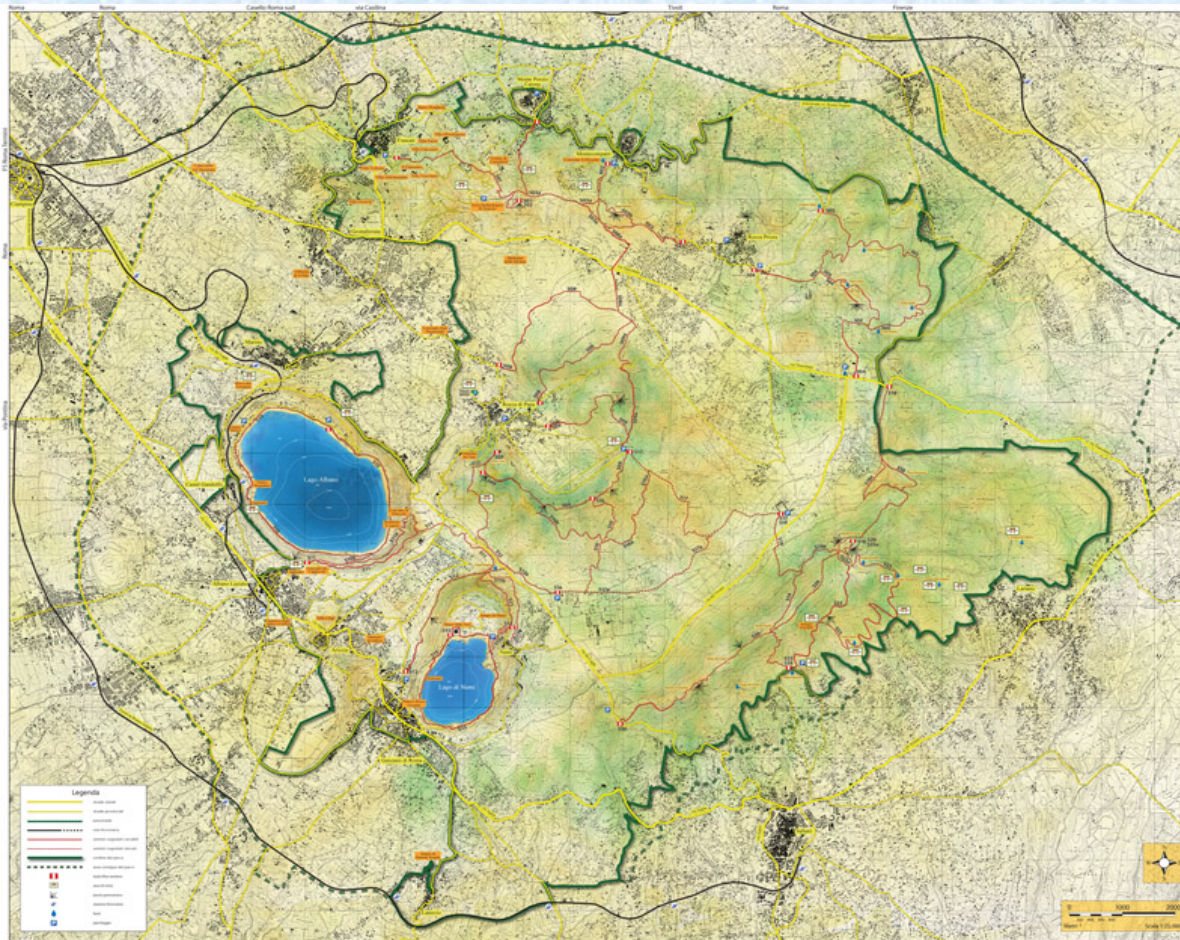


# Ecomuseums in the Lazio Region

## Ecomuseo dell'Agro Pontino



<http://www.ecomuseoagroponentino.it/>



*Carta escursionistica del tour dei Castelli Romani  
a cura dell'Uff. Comunicazione dell'Ente Parco dei Castelli Romani*

*Geophysics on stage...Lanza T. et al. [Tiziana.Lanza@ingv.it](mailto:Tiziana.Lanza@ingv.it)*



We subdivided the itinerary into three items

1) the Roman Ships Museum 2) The Lake itself 3) Diana temple.

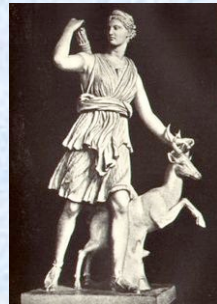
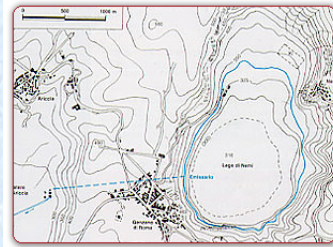
- The first is a museum devoted to the ships that Caligula the Emperor ordered to built (37-41 b.C);
- The lake is of volcanic origin as the whole area and its emissary is an example of roman engineering (V-VI b.C.)
- Diana Aricina Myth together with The Rex Nemorensis are linked to fertility;

From a naturalistic point of view: aquatic birds as grebes, cormorants, pochards, coots.

Vegetation as reeds lake, chestnuts, mimosa

## Nemi Lake itinerary



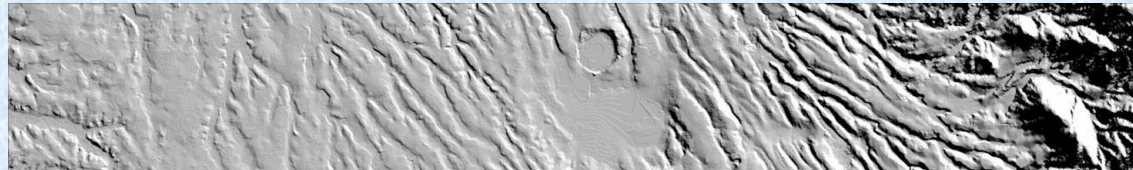


© - libomir hlasek  
www.hlasek.com  
Podiceps cristatus 4077

*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*

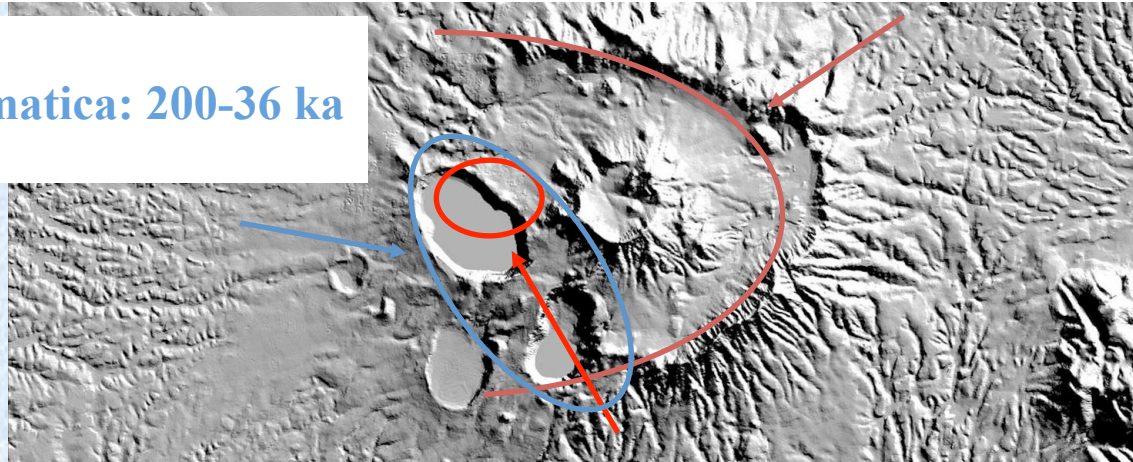


## Albani Hills Volcanic Complex: the three historical phases....



**Caldera della fase Tuscolano-Artemisio: 580-330 ka**

**Fase Idromagmatica: 200-36 ka**



**Caldera della fase Campi di Annibale-Faete: 330-200 ka**



# Whorship places





## Towards the performance

- 1) Choosing the itinerary
- 2) First inspection on the itinerary places
- 3) Attending the lessons concerning the geophysics of the area, the history, the myths and legends, and the naturalistic aspects
- 4) Organizing the material in a creative way to write down the script for the performance
- 5) Preparing the performance
- 6) Performance on the places of the itinerary during the the European Day of the Parks (24 May 2010)





*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*







*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*





*Geophysics on stage...Lanza T. et al. Tiziana.Lanza@ingv.it*





## Evaluation

We asked the Socio-Pedagogical Lyceum (III F) to perform the evaluation.

We wanted to verify to which extent the lessons we gave and the tools and methodologies proposed were efficacious in transmitting to the students of the Lyceum Classicum (III A) new knowledge, skills and values.

We acquired the data and an elaboration is still in course. But we can already suggest some general conclusions.





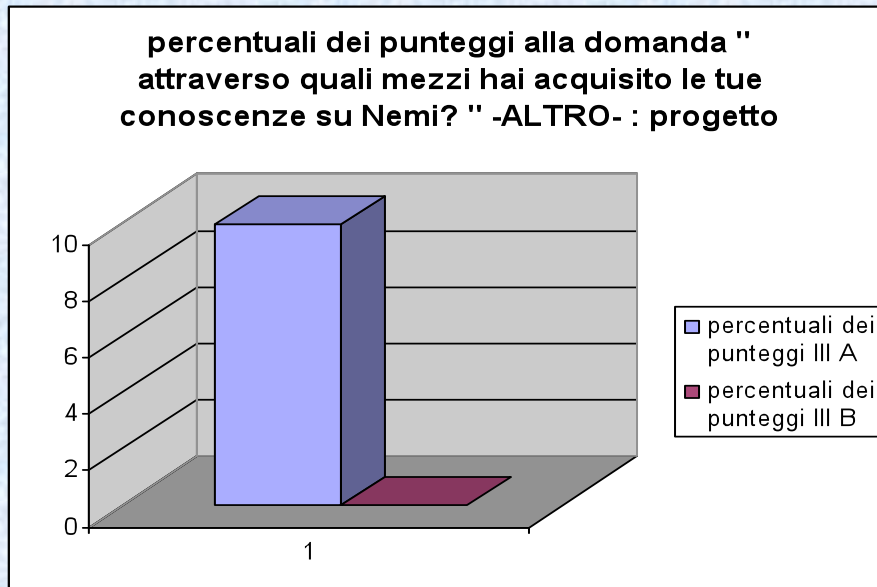
## Evaluation tools

- 1 - **Opening questionnaire**, substituted by one submitted to a checking group (Classical Lyceum III A)
- 2- A **direct and guided observation** during the final performance to detect several indicators
- 3- **Ending questionnaire**, aiming at detecting the changes occurred in the students participating in the project





# Results

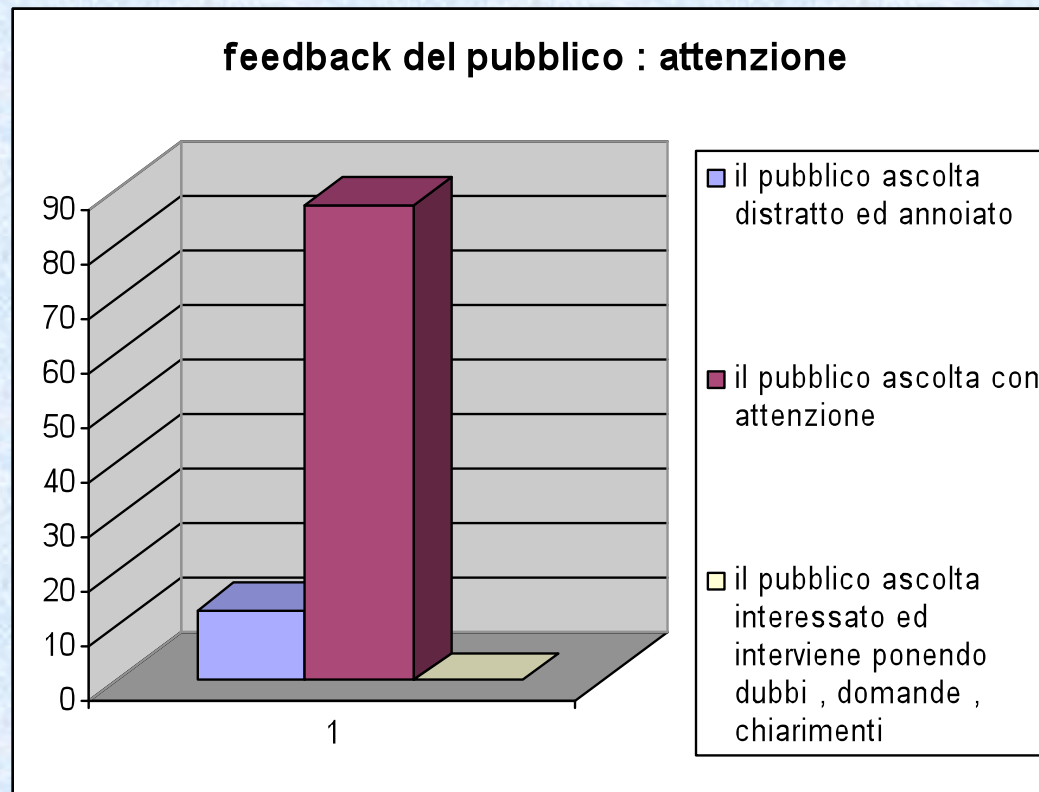


It is evident by comparing the results of the ending questionnaire with the opening one that the project contributed to increase the participants' knowledge of the area in any sense: geologically, historically, culturally





## The public feedback





## Conclusions 1

Even if the ending questionnaire showed good results with respect to the acquiring of new knowledge concerning the territory, the student ability in working in a multidisciplinary context, their ability in writing the script and in performing it and at the same time the ability to cooperate in order to transmit the acquired knowledge to the public during the final performance we should nevertheless remark that:

Comparing the two experiences, it is evident to us that while in the case of the primary school the involvement of the schoolmates was complete, in the second case only a small group of students of the III Classical Lyceum charged to produce the performance participated actively.





## Conclusions 2

It is of great importance when we decide to use theatre as a science education tool to have at our disposal teachers of several disciplines and several hours to be dedicated not only to the content transfer but also to the dramatization. Our experience suggests that it is better to involve the students in all the different phases that will bring to the performance, even in the evaluation process. If it is true that a knowledge transfer is guaranteed, the same cannot be said for the development of a seismic risk awareness that requires more commitment. The same is for the students' approval, especially for those of the secondary school. Innovative way to gain students enthusiasm should be thought even if our experience suggests that dramatization could be a privileged way to convey Earth education, seismic risk and the love for the environment.







## Suggestions



- Victor Turner (1986) From Ritual to Theatre: The Human Seriousness of Play -
- Negrete A. Lartigue C (2010) The science of telling stories: Evaluating science communication via narratives (RIRC method) Journal Media and Communication Studies Vol 2(4), pp.98-110
- Lanza T. Negrete A. (2007) From myth to Earth education and science communication in Piccardi, L. and Masse W.B. (eds) Myth and Geology, GSL, London, Special Publication, 273, 61-63
- Lanza T. D'Addezio G. La Longa F. Crescimbene M. Ciaccio M. Marsili A. (2009) Once Upon a time a fisherman: Science theatre at INGV Oral presentation Geoitalia 2009 retrieved from:  
<http://www.earth-prints.org/handle/2122/5862>
- <http://www.tizilanza.net/Ecomuseo.html>
- <http://www.youtube.com/user/EcomuseodeiCastelli>
- <http://www.parcocastelliromani.it/>





# Acknowledgements



We address special thanks to all the teachers of the schools participating in the projects and to their students

**For the first project:** Geri Braccialarghe; Elisabetta de Lucia; Maria Assunta Trotta; Maria La Serra; Carmelina Ciaccio; Of the Primary School F.Di Donato in Rome and one of the mothers, Susanna Marani, for preparing the scene costumes

**For the second project:** Valeria Morganti Classicum Lyceum III A Caterina Niccolò and Luigia Imperato Socio-Pedagogical Lyceum III F from the Mancinelli&Falconi Institute in Velletri.

We are also very grateful to PCST2010

