

GRAN SASSO  
SCIENCE INSTITUTE

*SCHOOL OF ADVANCED STUDIES*

**GSSI & LNGS**

Ivan DE MITRI

Gran Sasso Science Institute  
&  
INFN, Laboratori Nazionali del Gran Sasso

[www.gssi.it](http://www.gssi.it)

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# GSSI birth history

Initial project of an International PhD  
School presented at: **OECD – MEF Meeting**  
“L’Aquila after the Earthquake”, Rome 3.7.2009

*Endorsed by*  
**OECD - University of Groningen study group 2010/11**

*Supported by:*  
**Abruzzo Region, INFN, MIUR**

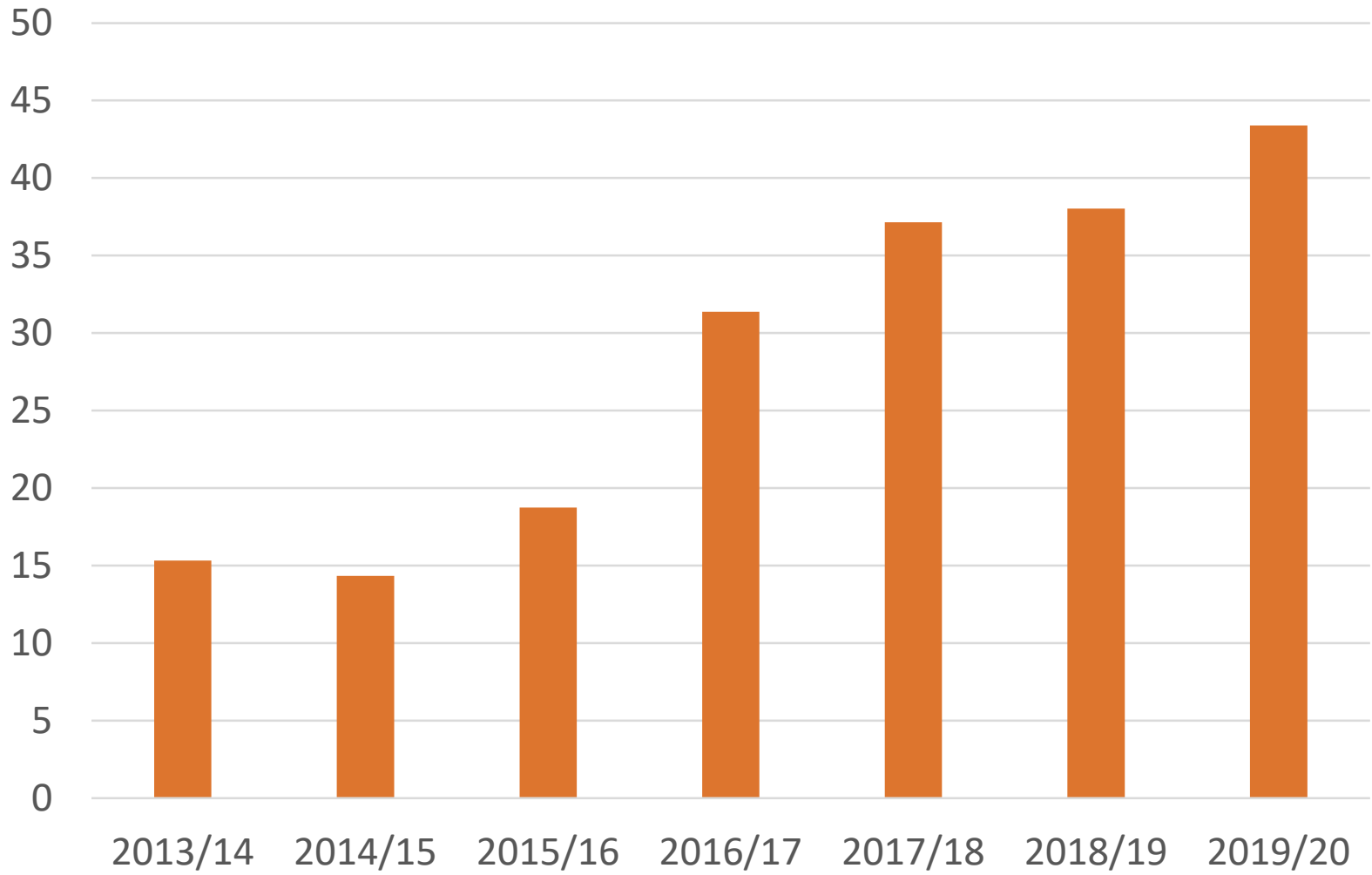
- Experimental Phase as INFN Center of Advanced Studies: 07/2013 - 09/2016  
Sissa, IMT, Sant’Anna, Univaq
- PhD School since September 2016



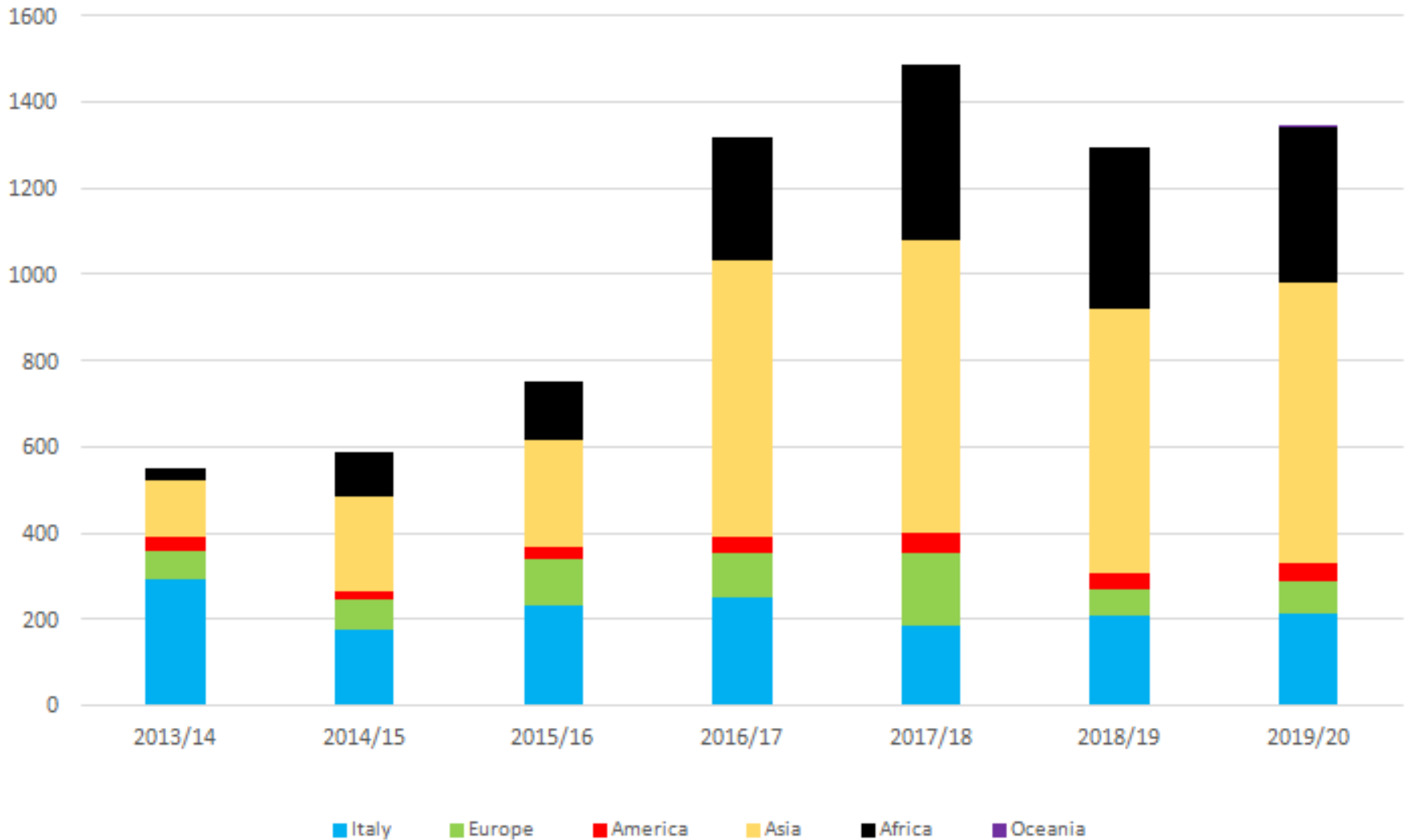
OECD (Organization for Economic Cooperation and Development)  
Report: SPREADING THE EAGLE'S WINGS SO IT MAY FLY:  
RELAUNCHING THE ECONOMY OF L'AQUILA REGION, GOV/TDPC/RD(2009)8

<http://www.oecd.org/dataoecd/0/36/43307733.pdf>

# PhD applications per scholarships available

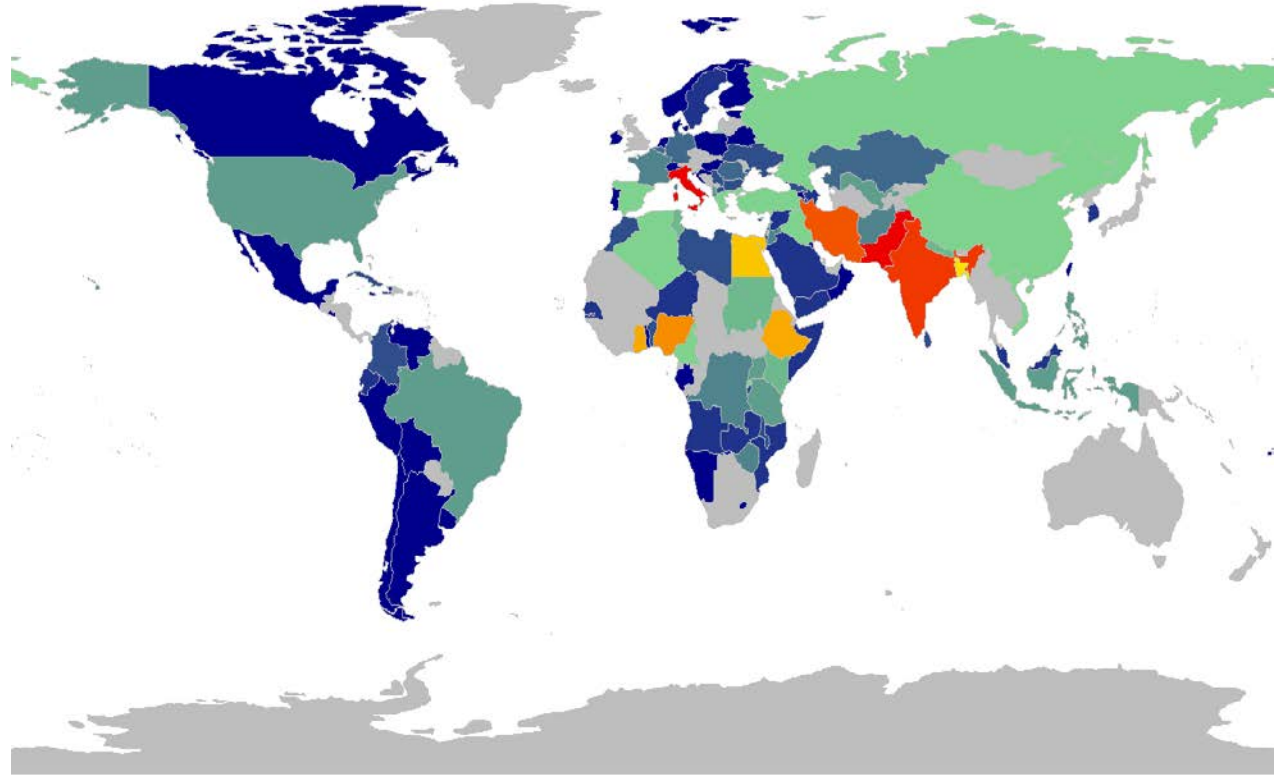


# PhD applications from different geographical areas



# Origin countries of GSSI applications

- |                |             |                 |
|----------------|-------------|-----------------|
| Afghanistan    | Germania    | Repubblica Ceca |
| Albania        | Ghana       | Repubblica      |
| Algeria        | Grecia      | Dominicana      |
| Angola         | Guatemala   | Romania         |
| Argentina      | Guinea      | Russia          |
| Armenia        | India       | Ruanda          |
| Azerbaijan     | Indonesia   | Arabia Saudita  |
| Bangladesh     | Iran        | Senegal         |
| Bharein        | Iraq        | Serbia          |
| Belgio         | Israele     | Slovenia        |
| Benin          | Italia      | Somalia         |
| Bielorussia    | Jamaica     | Sud Africa      |
| Bosnia         | Giappone    | Spagna          |
| Erzegovina     | Giordania   | Sierra Leone    |
| Brasile        | Kazakhstan  | Siria           |
| Bulgaria       | Kenya       | Sri Lanka       |
| Burma          | Kosovo      | Stati Uniti     |
| Burkina Faso   | Kuwait      | Sudan           |
| Burundi        | Libano      | Suriname        |
| Camerun        | Liberia     | Svezia          |
| Canada         | Libia       | Svizzera        |
| Chad           | Lituania    | Taiwan          |
| Cile           | Lussemburgo | Tajikistan      |
| Cina           | Macedonia   | Tanzania        |
| Cipro          | Malesia     | Togo            |
| Colombia       | Messico     | Tunisia         |
| Corea del Sud  | Mongolia    | Turchia         |
| Costa D'avorio | Marocco     | Ucraina         |
| Congo          | Mozambico   | Uganda          |
| Croazia        | Mali        | Emirati Arabi   |
| Cuba           | Malawi      | Uzbekistan      |
| Danimarca      | Namibia     | Venezuela       |
| Ecuador        | Nepal       | Vietnam         |
| Egitto         | Nigeria     | Yemen           |
| El Salvador    | Norvegia    | Zambia          |
| Eritrea        | Oman        | Zimbabwe        |
| Etiopia        | Paesi Bassi |                 |
| Filippine      | Pakistan    |                 |
| Finland        | Palestina   |                 |
| Francia        | Peru        |                 |
| Gabon          | Polonia     |                 |
| Gambia         | Portogallo  |                 |
| Georgia        | Regno Unito |                 |



# 2019/20 Students



BELMARTINO Andrea



CAPORALI Carlo



CELI Emanuela



COCOCCIA Eleonora



CODAZZO Elena



COTUMACCIO Nicola



DAMIANI Angelo



DE MEIJERE Giulia



DI GIAMBATTISTA  
Flaminia



FATIKHOVA Adelia



FIORAVANTI Simone



FOSSEMÒ Andrea



LORENZI Federica



NARAYANAN KUTTY  
Hrishikesh



PARENTI Andrea



PRAJAPATI Atul



GIANNIS Konstantinos



GUBBIOTTI  
Alessandro



HAZRA Nandini



LOFFREDO Eleonora



ROSSI Mirko



SABERBAGHI  
Hamidreza



SASABE Takashi



Savostianov Anton



SILVERI Leandro



SONZOGNO Giulia  
Valeria



TORELLI Samuele



VARGIU Leonardo



VECCHIATO Giacomo



VIERA LOPEZ Gustavo

National Research University Higher School of Economics	
Sharif University of Technology	
Università di Pisa	2
Sciences Sorbonne Université	
University of Padua	2
Università degli studi di Roma "Tor Vergata"	3
Universidad de la Habana	
University of L'Aquila	2
University of Ioannina	
University of Udine	
Sapienza Università di Roma	2
University of Mumbai	
Indian Institute of Science Education and Research (IISER), Pune	
Università degli Studi di Firenze	
Università degli Studi di Trento	
University of Valencia	
University of Salento	
Roma Tre University	
Alma Mater Studiorum - Università di Bologna	
LUISS Guido Carli	
Sciences Po	
Universidad Nacional de La Plata	
Università degli Studi di Sassari	
Lomonosov Moscow State University	
Male	19
Female	12
Italian	19
Foreign	12
Total enrolled students	31



# GSSI postdocs



ALASIO Luca



BECKER Ruben



BRETT Caroline



BURLINA Chiara



DADDABBO Antonio



DALL'OSSO Simone



DE SANCTIS Martina



DRAGO Marco



CARAMASCHI Sara



CARTA Giuseppe



CICCONOFRI Giancarlo



CICERONE Gloria



DUNDOVIC Andrej



ESQUIVEL Liliana



GHEASI Masood



GILBERT Hugo



COPELLO Simone



CORTEZ Andre



CRISTOFARI Pierre



CSEDEKRI Laszlo



GRABMAYER Clemens



GRAZIOLI Margherita



GUGLIELMI Roberto



HORIKAWA Sosuke



KODRIC Bojana



LUMLEY - SAPANSKI  
Audrey



MANTEGAZZI Daniele



MARCHESANI Stefano



OGANESYAN Gor



PEZZI Oreste



PINATE Adriana  
Carolina



SCANDONE Raffaele



MEI Yu



MENSAH Prince Romeo



MKRTCHYAN Vahan



NILAKANTHA Paudel



SERAFINO Paolo



THORPE Thomas  
Nathan



TKACHOV Pasha



VINCI Cosimo

# Professors: Physics

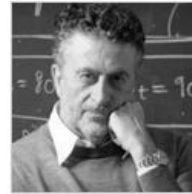
## Professors



ALOSIO Roberto



BLASI Pasquale



COCCIA Eugenio



DE MITRI Ivan



FERRONI Fernando



GALBIATI Cristian



VISSANI Francesco

## Associate Professors



BARACCHINI Elisabetta

## Senior Professors



BEREZINSKY Veniamin



PETRERA Sergio



RUBBIA Carlo

## Assistant Professors



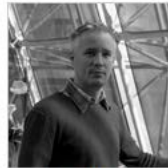
BRANCHESI Marica



DI MARCO Natalia



EVOLI Carmelo



HARMS Jan



PAGLIAROLI Giulia



# Physics (visiting professors)

## Visiting Professors



AHARONIAN Felix



APRILE Elena



ARNEODO Francesco



BATTISTONI Giuseppe

And many others....



BERNABEI Rita



CALAPRICE Frank



CALDWELL Allen



CAPOZZIELLO  
Salvatore



CREMONESI Oliviero



FAFONE Viviana



FERRARI Valeria



FIORINI Ettore



MARCUCCI Elisa



MATARRESE Sabino



PANDOLA Luciano



RAGAZZI Stefano



IACHELLO Francesco



KATSAVOUNIDIS Erik



KUDRYAVTSEV Vitali



LIPARI Paolo



SALUCCI Paolo



TAVANI Marco



ULLIO Piero



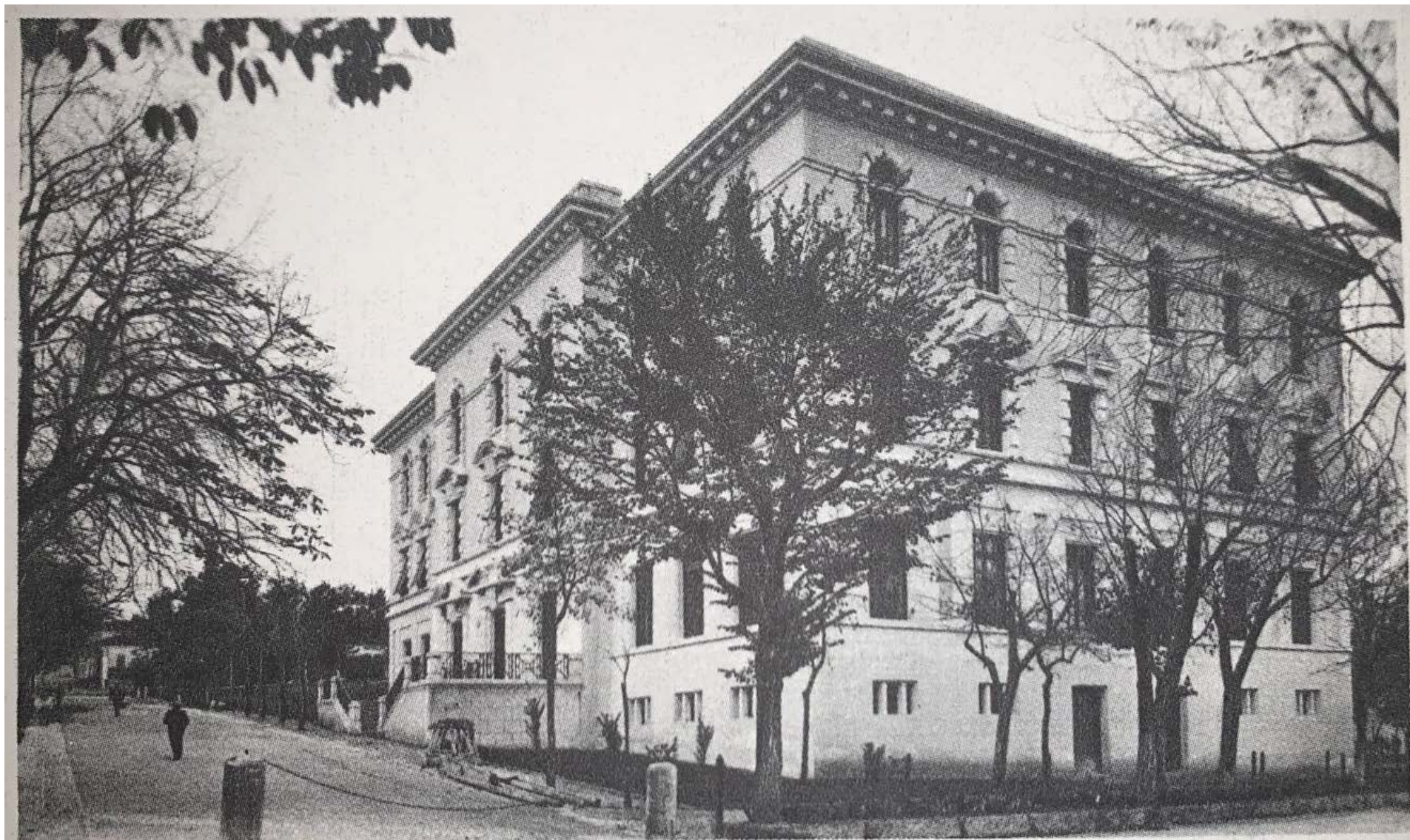


*L'AQUILA • Casa Giovane Italiana*



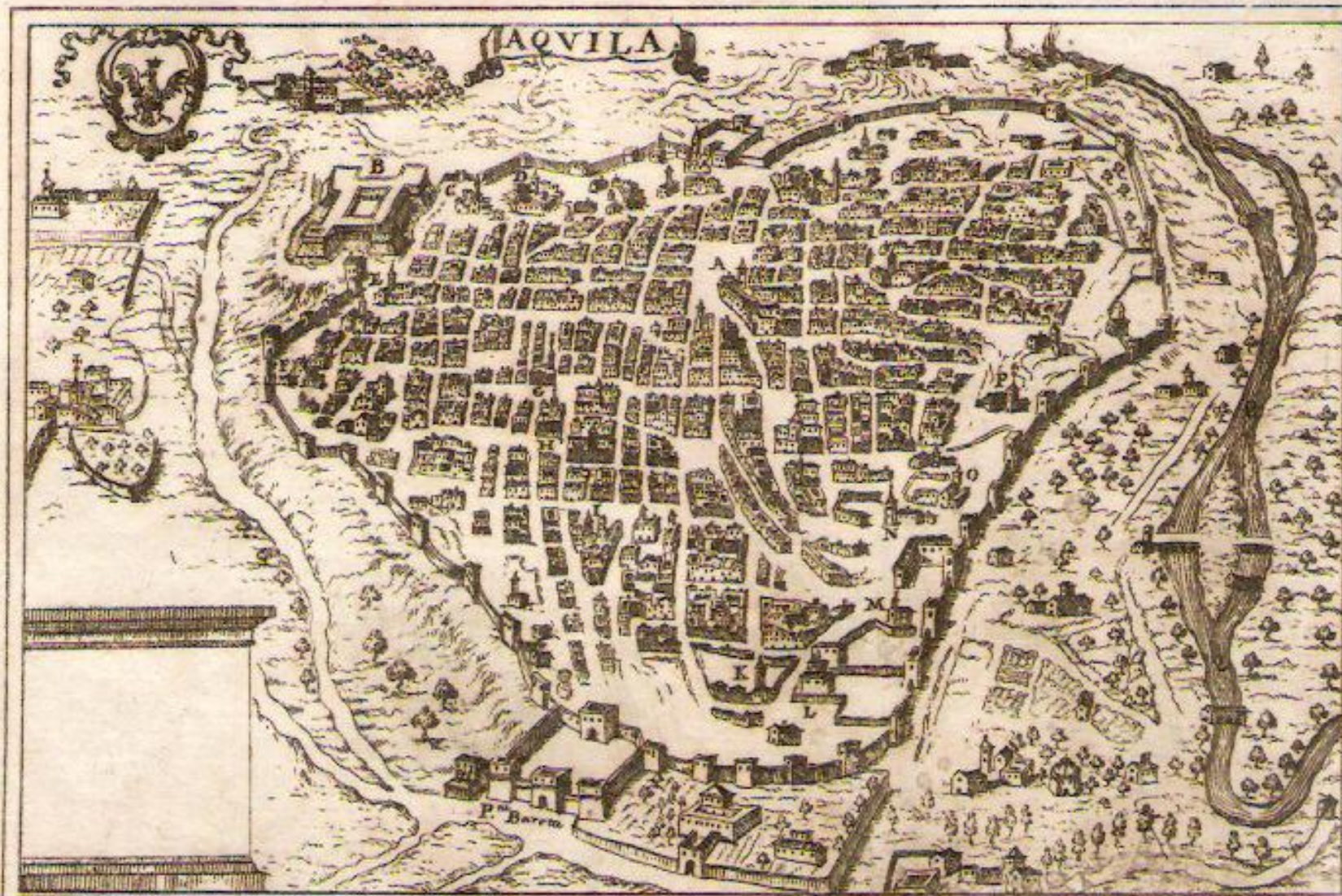






*Aquila - La Casa del Balilla.*





A. Vescovato. B. Castello. C. il Carmine. D. S. Bernardino Zoccol. E. C. del Crocifisso. F. S. Agnese Moni. G. Pal. del Magistrato. H. il Gesù e Colleg. I. S. Domenico. K. S. Maria Rivera Coll. L. S. Maria del Re. M. S. Vito Ospitale. N. S. Croce. O. S. Gesuacomi. R. S. Mar. del Borgo. Q. F. Averno.



You are here





# GSSI "campus"

Canteen

Rectorate building



Student housing

"Mariani" building

"ex-ISEF" building

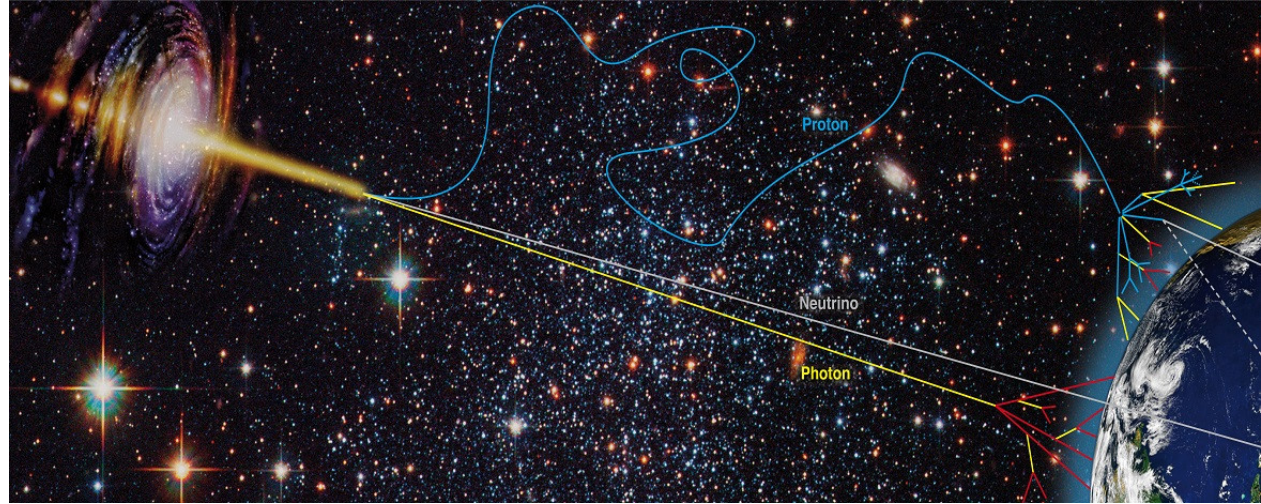
Open space





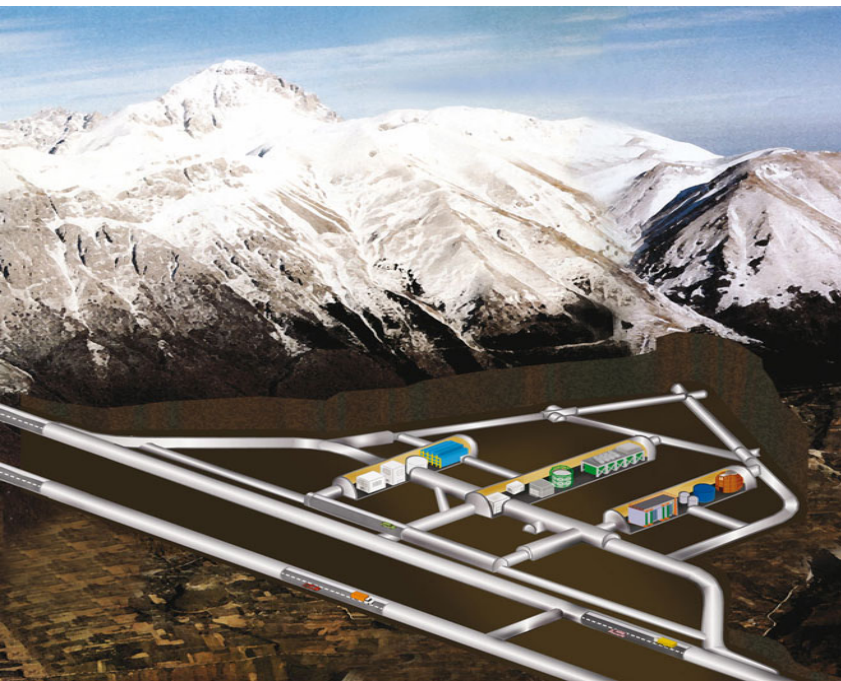


# Astroparticle Physics at GSSI

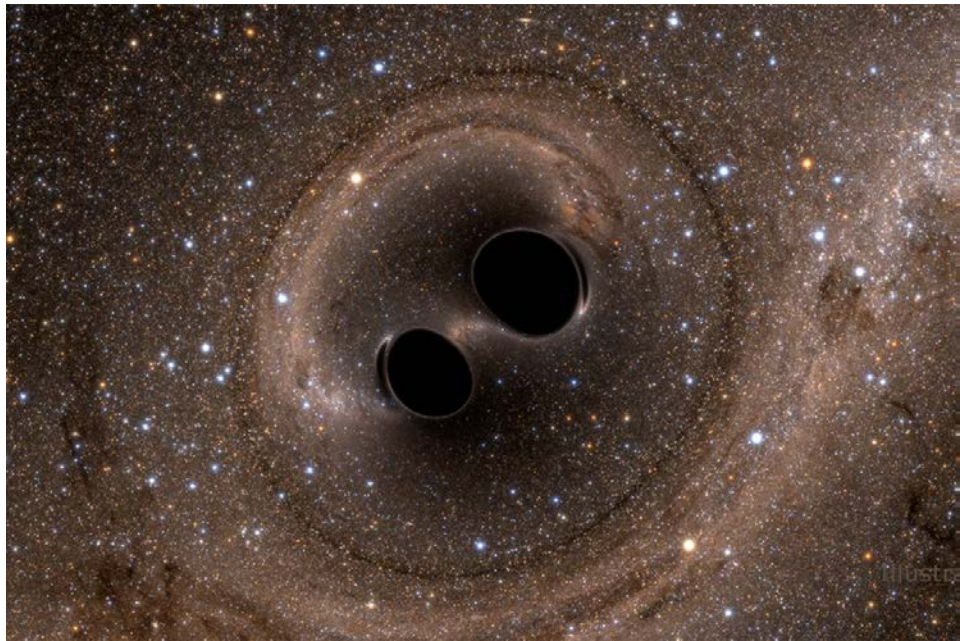


## High Energy Cosmic Radiation

## Rare event searches



## Gravitation & Cosmology



# Low Energy Astroparticle Physics: AP-LE

ID	Lecturer	Title	Time slots
LE-TH	F. Vissani	Theory	24
LE-EXP	F. Ferroni - C. Galbiati	Experiments	24
LE-1	E. Previtali	Low radioactive background techniques for rare event searches	8
LE-2	P. Ullio	Dark Matter candidates: theory	8
LE-3	E. Baracchini	Direct Dark Matter searches	8
LE-4	L. Marcucci	Nuclear Astrophysics	8
LE-5	M. Laubenstein – M.Junker	Radiation measurements (laboratory course)	8
LE-6	L. Pandola	Monte Carlo techniques	8
LE-7	N. Di Marco	Neutrino oscillation experiments	8
LE-8	A. Puiu + M.Messina	Cryogenic sensors and related electronics	8

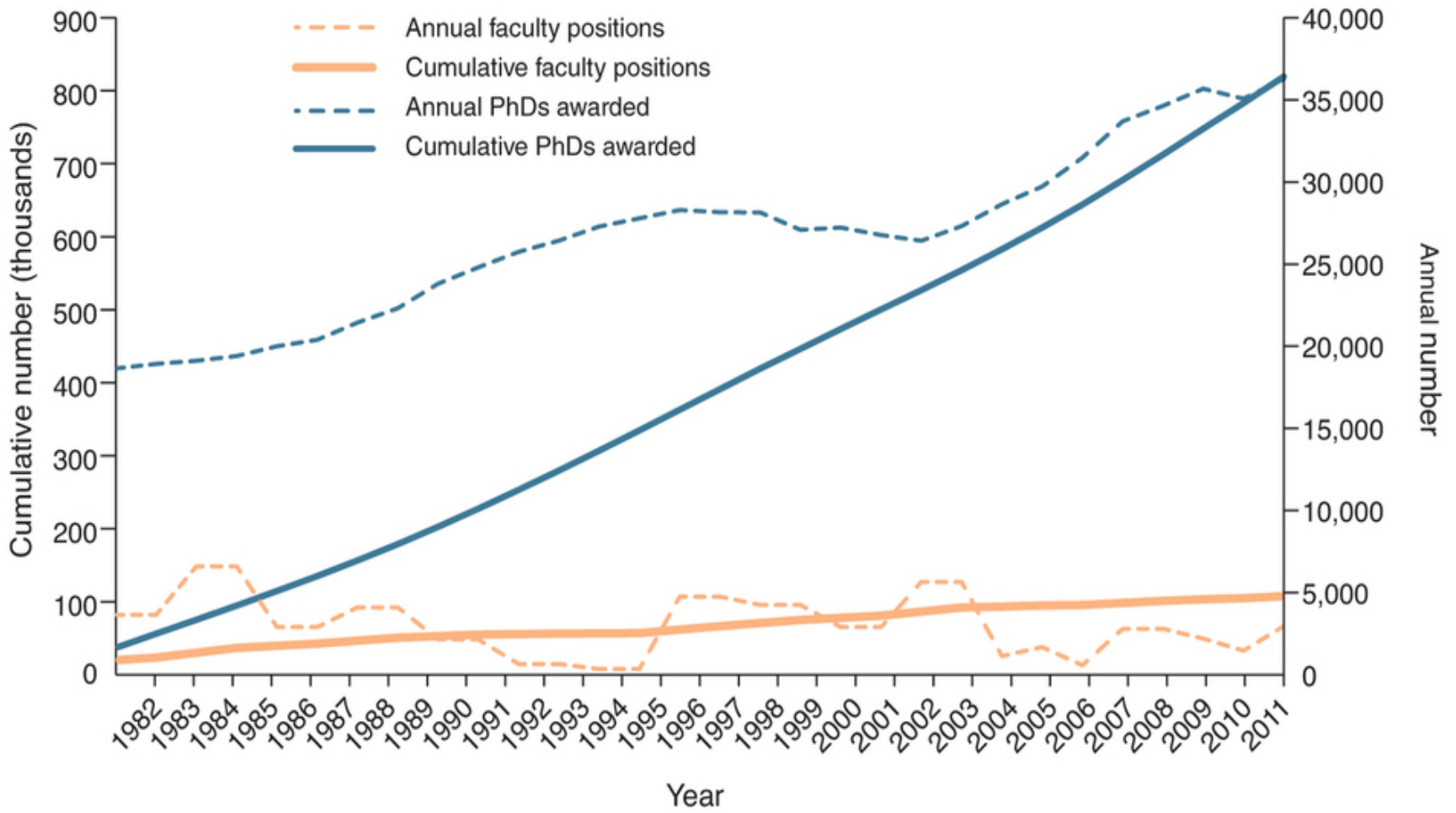
# High Energy Astroparticle Physics: AP-HE

ID	Lecturer	Title	Time Slots
HE-TH	P. Blasi	Theory	24
HE-EXP	I. De Mitri	Experiments	24
HE-1	R. Aloisio	Non Thermal Processes	8
HE-2	S. Petrerà	Data Analysis Techniques in HE-AP	8
HE-3	G. Ambrosi - O. Adriani	Tracking and calorimetric systems in space-based experiments	8
HE-4	F. Aharonian	Very high energy gamma ray astronomy	8
HE-5	V. Bonvicini	Front-end and readout electronic systems for HE –AP	8
HE-6	P. Lipari	Neutrinos and multimessenger observations	8
HE-7	V. Berezhinsky	UHECR theory	8
HE-8	C. Evoli	Astrophysical Hydronamics	8



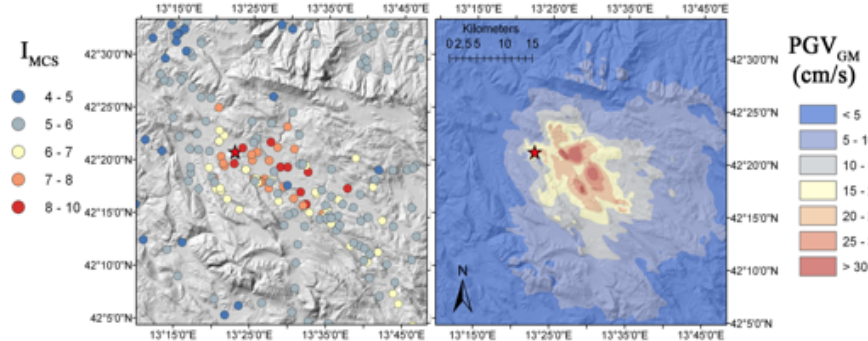
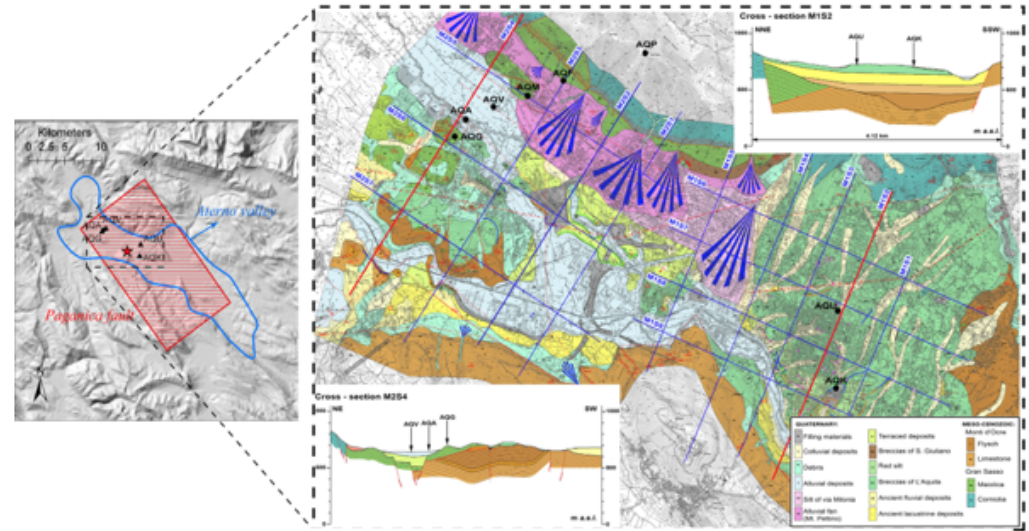
# Gravitation and Cosmology: AP-GC

ID	Lecturer	Title	Time slots
<b>GC-TH</b>	<b>S. Capozziello – S. Matarrese</b>	<b>Theory</b>	<b>24</b>
<b>GC-EXP</b>	<b>J. Harms –M. Branchesi</b>	<b>Experiments</b>	<b>24</b>
GC-1	J. Harms – W. Weber	Next generation GW observatories	8
GC-2	G. Oganesyan	Astrophysical transients	8
GC-3	S. Cristallo	Nucleosynthesis	8
GC-4	M. Mannarelli	Physics of compact stars	8
GC-5	G. Pagliaroli	Low energy gamma and Neutrinos from GW events	8
GC-6	V. Fafone – M. Drago	Advanced Virgo and GW data analysis	8
GC-7	P. De Bernardis – A.Cimatti	Observational Cosmology	8
GC-8	M. Mapelli	Compact object formation and evolution	8



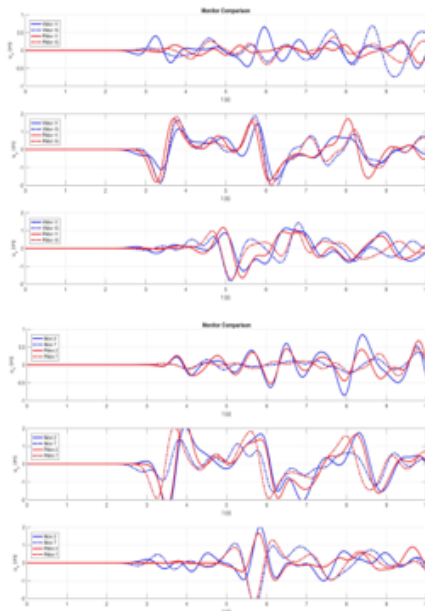
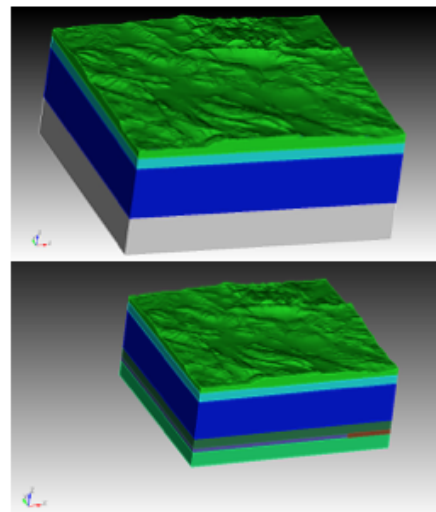
Inclusion of the (full) soil structure

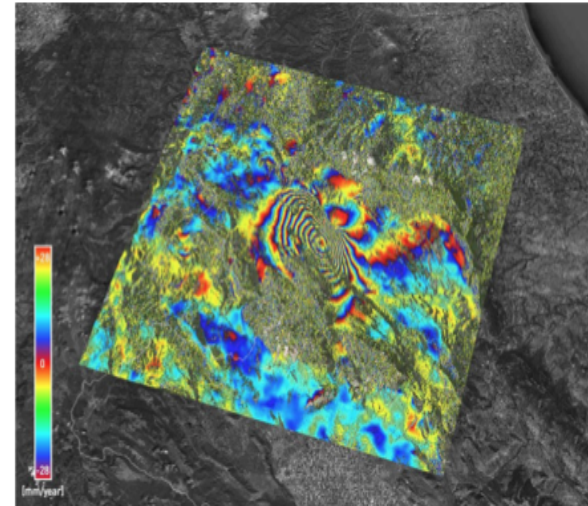
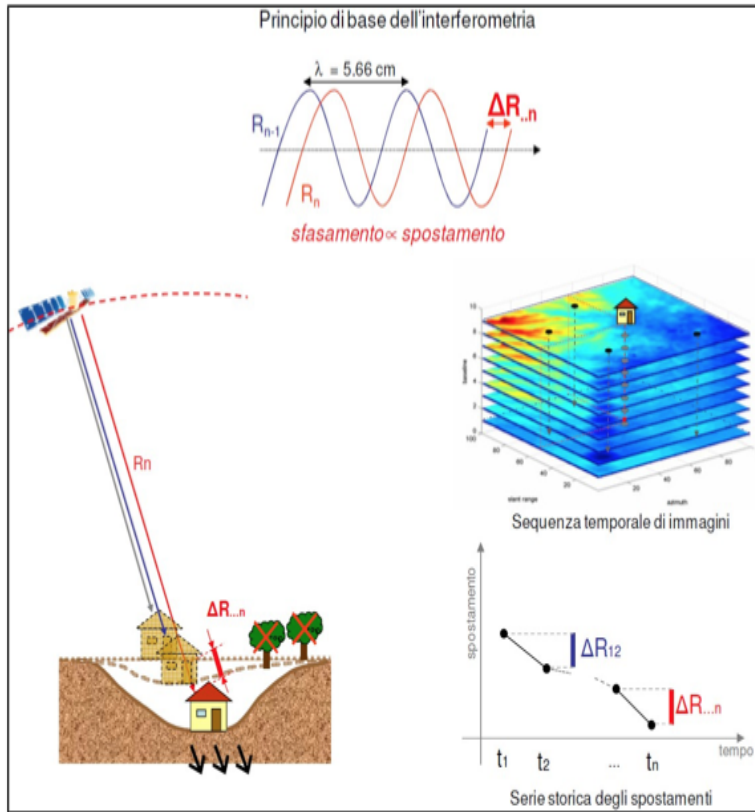
- ✓ Complete fault structure of the domain centered around L'Aquila (45x45x20 km)
- ✓ Geological data from the micro-zoning performed in the framework of the reconstruction works.



Web based platform with

- ✓ Maps of the local expected displacement for given earthquake (<10 m resolution)
- ✓ Maps of seismic risk assessment building by building





### Interferometric Synthetic Aperture Radar (InSAR)

- ✓ Displacements monitoring (<1 cm resolution, GHz frequencies)
- ✓ Maps of seismic risk assessment building by building
- ✓ Complementary to the drones monitoring





# PhD at GRAN SASSO SCIENCE INSTITUTE





photo: A. Lolli

# Thank you



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