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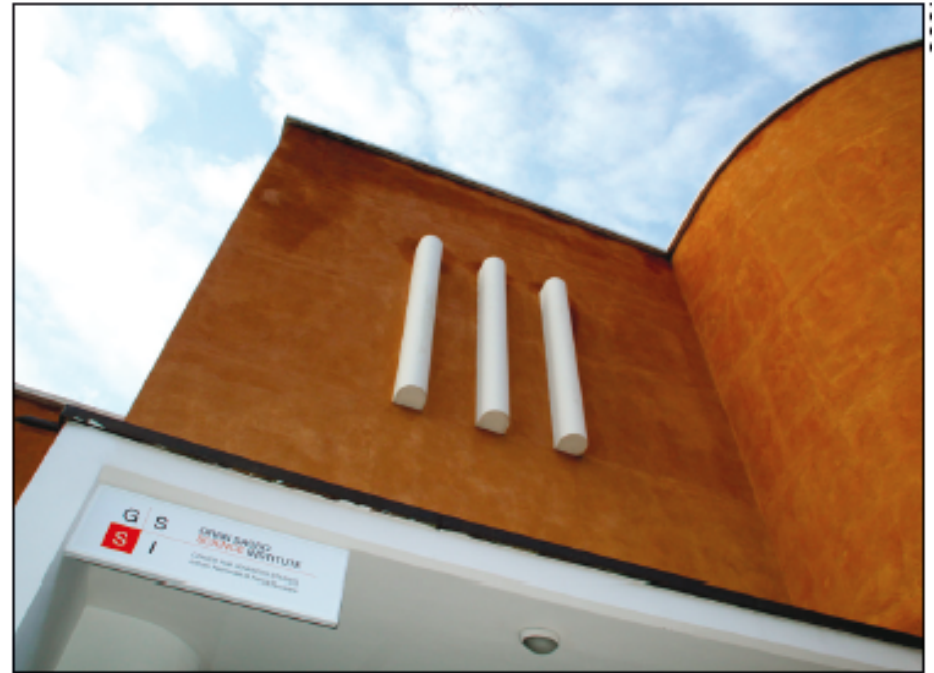
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GRAN SASSO
SCIENCE INSTITUTE

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CENTER FOR ADVANCED STUDIES
Istituto Nazionale di Fisica Nucleare



Gran Sasso Science Institute

Eugenio Coccia

6 April 2009
L'Aquila earthquake



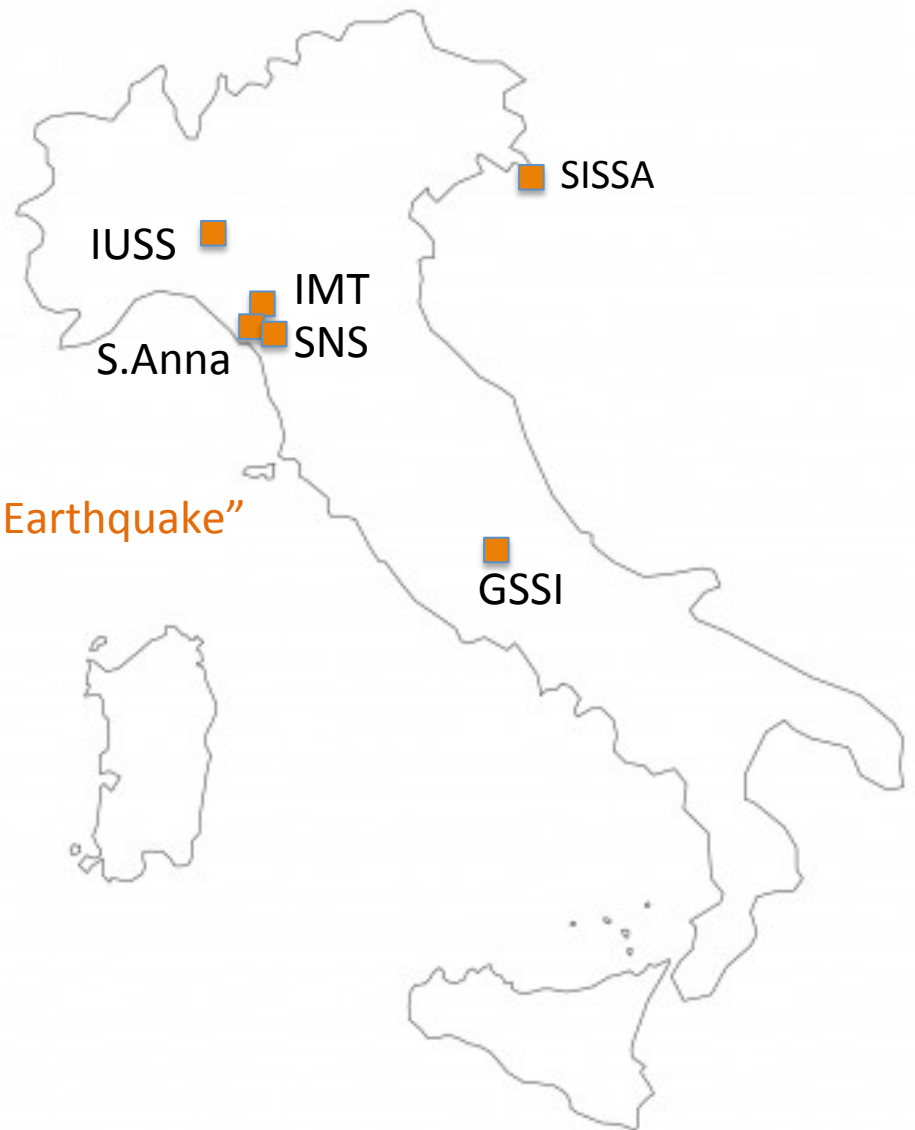
Some History

Initial project of an International PhD
School presented at:

OECD – MEF Meeting “L’Aquila after the Earthquake”
Rome 3.7.2009

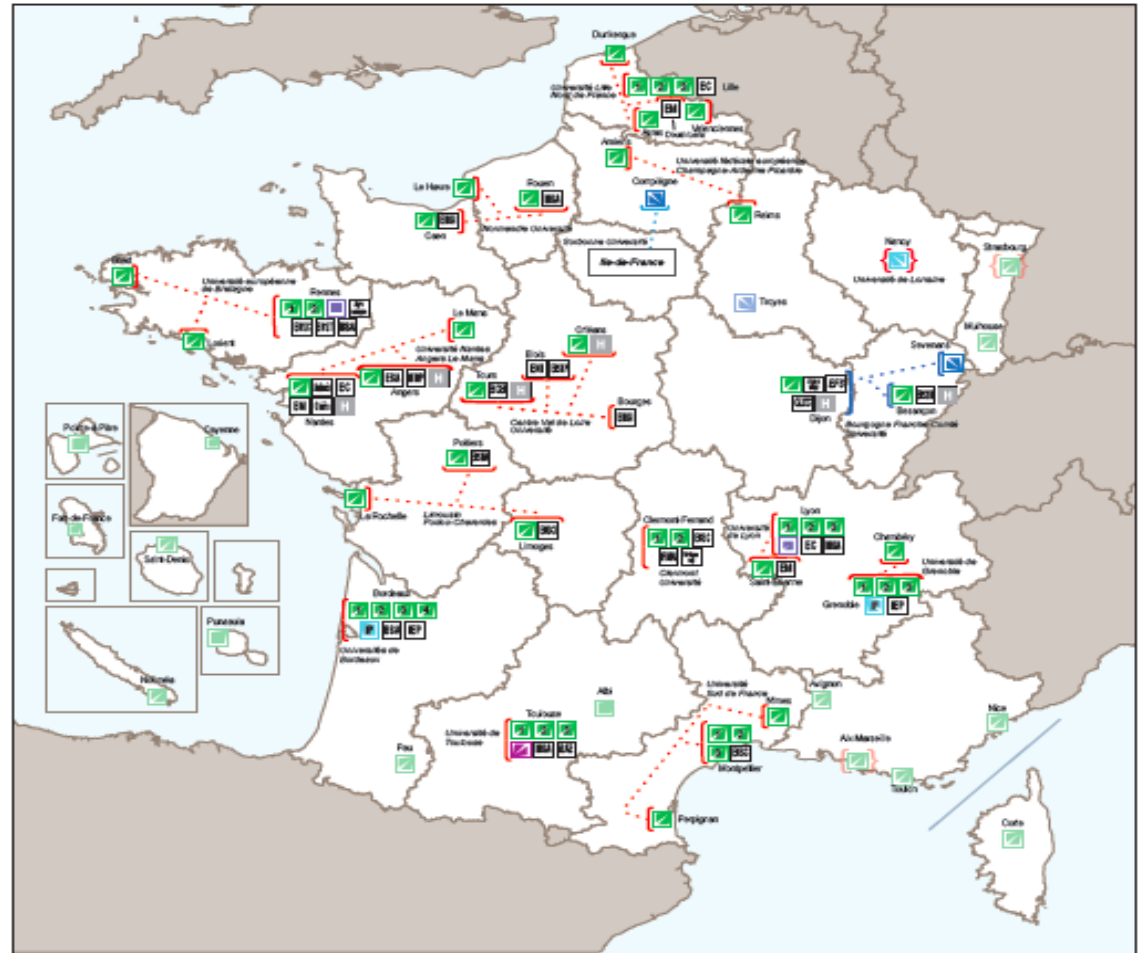
Endorsed by the Report from
OECD-University of Groningen – 2010/11

Supported by:
Abruzzo Region
INFN



France has 20 "grand établissements" and 3 "écoles normales supérieures"

<http://bit.ly/ZPRQKY>











Pôles de recherche et d'enseignement supérieur (membres fondateurs)

]-.-.-[EPCS (établissement public de coopération scientifique)

]---[FCS (fondation de coopération scientifique)

Etablissement issu d'une fusion { }

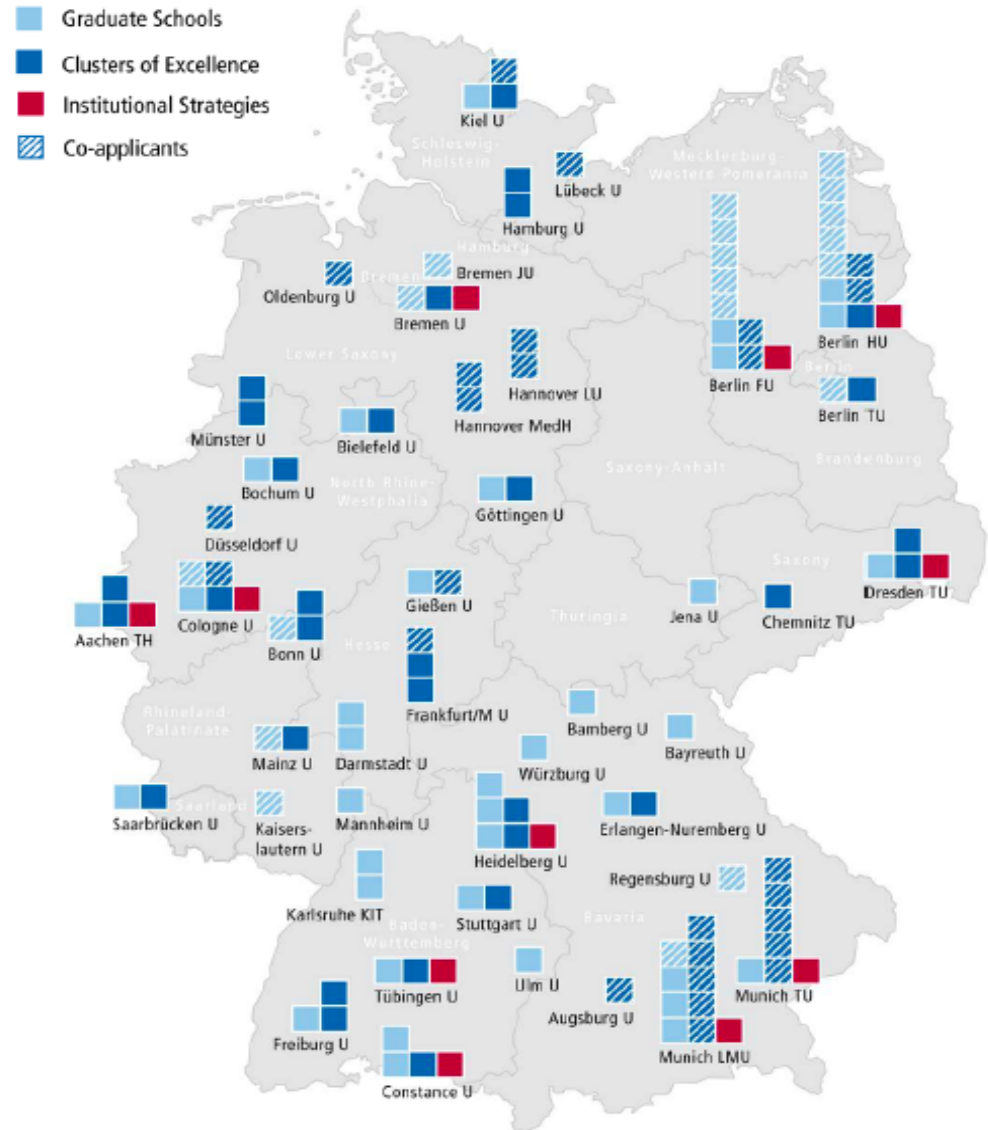
Établissements d'enseignement supérieur

-  Universités
-  Universités autonomes
-  Universités de technologie autonomes
-  Instituts nationaux polytechniques autonomes
-  Grands établissements
-  Écoles normales supérieures - ENS
-  Écoles normales supérieures autonomes
-  Autres établissements d'enseignement supérieur

Autres établissements et organismes

-  PRES FCS
-  CHR, CHRU, CHU
-  Divers

Germany since 2000 has activated a series of PhD school in collaboration between Universities and research center, mainly Max Planck. (<http://bit.ly/17qUjOi>).



1. Mission

The GSSI mission is twofold:

- to further promote L' Aquila and the local University as an higher education center able to attract the best students from all over the world;
- to create a bridge between academic and industrial research.

GSSI could will do this in the following ways:

1. Providing higher education to **selected graduate students** through three years PhD courses (on the model of *SISSA* in Trieste).
2. Providing several specialized courses to **selected undergraduate students** of L' Aquila University School of Sciences, in addition to the standard Laurea degree courses provided by the University of L' Aquila (on the model of the *Scuola Normale Superiore in Pisa*).
3. Fostering connections between the GSSI students and researchers and managers from business and industrial sectors.

In 2012 the Italian Government, on the basis of the National Law 35/2012, established the GSSI and gave to INFN the role of *activator*.

INFN has framed the GSSI in its organizational structure, for the first three years of activity, as a *National Center for Advanced Studies*.

An advisory committee, nominated by the Minister of Research indicated the partner Universities:

SISSA Trieste

Sant'Anna Pisa

IMT Lucca



PhD

Partner Universities

Physics

Mathematics

Computer
Science

Social Sciences



Scuola Superiore
Sant'Anna
di Studi Universitari e di Perfezionamento



GSSI, Viale Francesco Crispi 7, 67100 L'Aquila



November 14, 2013



The Gran Sasso Science Institute

It is an international PhD school and a center for advanced studies in physics, mathematics, computer science and social sciences.

Its purpose is to form high level human capital, integrating education and research in a lively interdisciplinary environment.

PRE-APPLICATION

Organization

SEMINARS AND EVENTS

Reconstruction of Abruzzo

March 21st, L'Aquila. The Minister for Territorial Cohesion Fabrizio Barca explains all the activities that have been carried out for the...

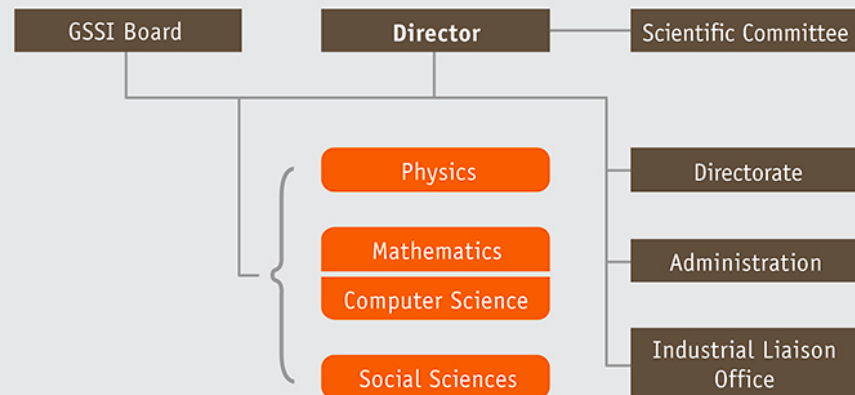
Urban Laboratories

April 26th. Public lecture of the Cities, health and well-being event series hosted by LSE Cities

ANNOUNCEMENTS

EPS, HORIZON 2020 will be an opportunity

The European Physical Society (EPS) has issued a statement on research and education opportunities for innovation in Horizon 2020.



GSSI Management

Director

E. Coccia (INFN-GSSI and U. Rome Tor Vergata)

Coordinators

Physics: *F. Vissani (INFN-LNGS and GSSI)*

Mathematics & CS: *P. Marcati (U. L'Aquila and GSSI)*

Social Science: *A. Calafati (GSSI and U. Ancona)*

Representatives:

A. De Simone (Sissa)

R. De Nicola (IMT)

N. Bellini (Sant'Anna)

Administration

L. Gentile (LNGS)

P. Della Ventura

R. Mosca

Secretariat

E. Ciocca

L. Faccia

I. Sartini

Technical services

M. Castagna (LNGS)

Network and web

A. Meschini

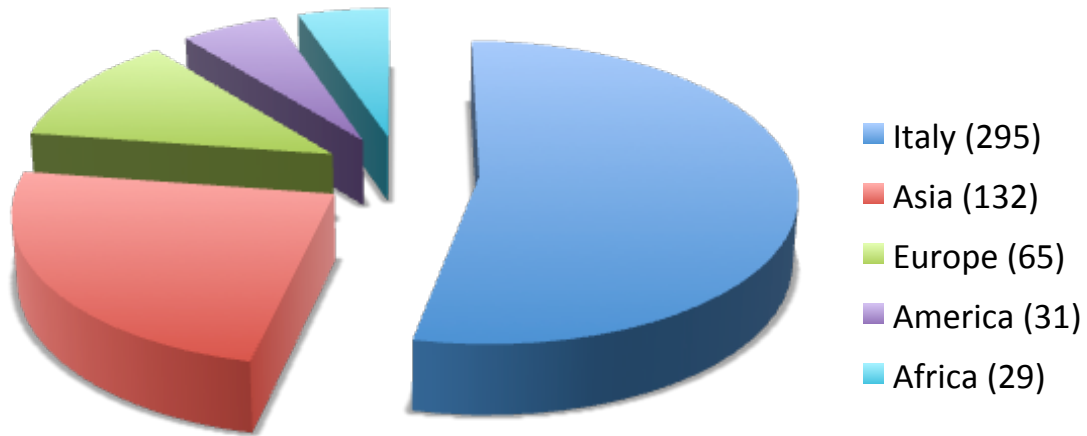
Safety

A. Giampaoli (LNGS)

Applications by curriculum



- Urban Studies (204)
- Astroparticle (145)
- Mathematics (114)
- Computer Science (8)



Total number of countries 63





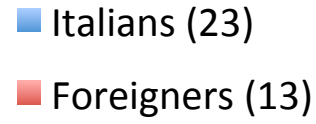
36 students admitted

10 Astroparticles

6 Math

8 Computer Sci.

12 Urban Studies



University of Strasbourg – France	
University of Cardiff – United Kingdom	
Total	

King's College London – United Kingdom	
Vrije University Bruxelles – Belgium	
Tbilisi State University – Georgia	
Yditepe University – Turkey	
University of Strasbourg – France	
University of Cardiff – United Kingdom	
Total	

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The PhD degree will be released jointly with prestigious educational institutions such as the post-graduate School for Advanced Studies (SISSA) of Trieste (Physics and Mathematics), the Scuola Superiore Sant'Anna of Pisa (Social Sciences) and IMT Lucca (Computer Science).

PhD in Astroparticle Physics

Research lines

Neutrino Physics: nature, mass, oscillation

Dark Matter

Nuclear Astrophysics

High Energy Astrophysics

Gravitational Waves

Physics beyond the Standard Model

Board of Professors

Felix Aharonian (Max Planck and DIAS)

Frank Calaprice (Princeton University)

Eugenio Cocchia (U. Roma Tor Vergata and GSSI)

Guido Martinelli (SISSA)

Antonio Masiero (U. Padua and INFN)

Sergio Petrerà (U. L'Aquila and GSSI)

Carlo Rubbia (GSSI)

Goran Senjanovic (GSSI),

Francesco Vissani (Chair, LNGS and GSSI)



UCLA





PhD in Astroparticle Physics

The main aim of the curriculum in Astroparticle Physics is to provide the entrance points and the scientific and cultural tools to participate successfully to the researches in particle physics, nuclear physics and astrophysics, high energy astrophysics, gravitation and cosmology. A special attention will be given to experimental and phenomenological aspects. Moreover, the PhD student in Astroparticle Physics at GSSI will have a special opportunity to follow and participate to the research conducted at the Gran Sasso National Laboratories (LNGS), with its wide community of scientists from all over the world.

The Astroparticle Physics curriculum consists of 3 years of study and research. The first year a wide choice of courses will cover a large spectrum of topics and the year will be concluded by a final exam. Students will work on a research project under the supervision of one or more teachers and scientists of the GSSI, of the INFN Gran Sasso National Laboratory and/or of the professors of the University of L'Aquila. Interdisciplinary approaches to the studies and research, exchanges of ideas and innovations are strongly encouraged.

TIMETABLE OF THE COURSES FOR THE YEARS 2013-2014

FIRST TRIMESTER

Nucl: Introduction to Nuclear Physics	<i>Fiorini</i>
ApN: Nuclear Astrophysics	<i>Marcucci</i>
SM: Standard Model and Extension	<i>Senjanović</i>
ν - e: Neutrino Physics – Experiments	<i>Calaprice</i>
ν - t: Neutrino Physics – Theory	<i>Vissani</i>
Stat: Statistics	<i>Caldwell</i>
N0: Neutrons and Backgrounds in Underground Labs	<i>Kudryatsev</i>
DMA: Dark Matter in Astronomy and Astrophysics	<i>Salucci</i>
Sym: Aspects of Symmetry	<i>Iachello</i>
DMt: Dark Matter Theory	<i>Ullio</i>
DMS: Dark Matter Search with Scintillators	<i>Bernabei</i>
MC: Montecarlo Methods	<i>Pandola</i>
0ν : Neutrinoless Double Beta Decay	<i>Cremonesi</i>
DMc: Dark Matter Search with Cryogenic Liquids	<i>Aprile</i>

SECOND TRIMESTER

DetB: Basics of Particle Detectors	<i>Petrea</i>
DetM: Modern Detectors	<i>Ragazzi</i>
HInt: Interactions of Hadrons at High Energy	<i>Battistoni</i>
NT: Non-Thermal Processes in Astrophysics	<i>Tavani</i>
CR: Cosmic Ray Acceleration	<i>Blasi</i>
HEγ: High Energy Gamma Rays	<i>Aharonian</i>
HEν: High Energy Cosmic Neutrinos	<i>Lipari</i>
GR: General Relativity	<i>Capozziello</i>
GWp: Gravity Waves Theory – a Primer	<i>Schutz</i>
GWs: Gravity Waves Theory – Astrophysical Sources	<i>Ferrari</i>
GWex: Gravity Waves Detection – Experiments	<i>Fafone</i>
GWda: Gravity Waves Detection – Data Analysis	<i>Katsavounidis</i>
Cosm: Cosmology	<i>Matarrese</i>

PhD in Mathematics in Natural, Social and Life Sciences

- NON LINEAR PARTIAL DIFFERENTIAL EQUATIONS, FLUIDS AND WAVES
- STOCHASTIC PARTICLES SYSTEMS AND MACROSCOPIC LIMITS
- INTRODUCTION TO THE CONTINUUM MECHANICS OF SOLIDS, FLUIDS AND BIOLOGICAL MATTER
- NUMERICAL METHODS
- STOCHASTICS METHODS
- MECHANICS AND SIMULATION

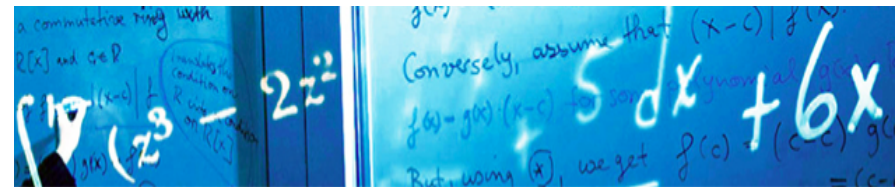
Board of Professors

Luigi Ambrosio (SNS Pisa),
Stefano Bianchini (SISSA),
Gianni Dal Maso (SISSA),
Antonio De Simone (SISSA),
Pierangelo Marcati (Chair, U. L'Aquila and GSSI)
Errico Presutti (GSSI)

+ A. Galves (U. São Paulo), G. Jona-Lasinio (U. Rome),
C. Lubich (U. Tübingen), F. Otto (Max Plank Leipzig),
G. Staffilani (MIT), L. Székelyhidi (U. Leipzig), C. Landim
(IMPA, Rio de Janeiro), E. Löcherbach (U. Cergy-Pontoise,
Paris), Y. Sinai (Princeton), M. E. Vares (UFRJ, Rio de Janeiro)

PhD in Computer Science

- FOUNDATIONS OF (MODERN) NETWORKS
- SOFTWARE SYSTEMS AND SERVICES
- SPECIFICATION AND ANALYSIS OF CONCURRENT REACTIVE SYSTEMS



Board of Professors

Antonia Bertolino (CNR)
Rocco De Nicola (Chair, IMT and GSSI)
Mariangiola Dezani (Università di Torino)
Michele Flammini ((Università dell'Aquila)
Paola Inverardi (Università dell'Aquila)
Paul Spirakis (University of Patras)

L. Aceto (Reykjavik University)
P. Crescenzi (University of Florence)
U. Montanari (University of Pisa)
D. Garlan (CMU, Pittsburgh)

PhD in Urban Studies

Research and post-graduate study at the GSSI's *Urban Studies Unit* focus on the long-term development trajectories of 'territorial systems', and 'urban systems' in particular (cities, metropolitan areas, metropolitan regions).

The evolution of the European urban system and territory is the main subject matter at *GSSI Cities*. The "cultural heritage" is a very important research topic at GSSI.



Board of Professors

G. Barbieri (ISTAT), Nicola Bellini (Sant'Anna), Monica Brezzi (OCSE), Antonio Calafati (Chair, GSSI), A. Golini (Luiss), Simona Iammarino (LSE), Philip McCann (Groningen), A. Rodriguez-Pose (LSE), G. Serravalli (U. Parma)



April 6, 2014