

SCIENCE IN SICILY

A very incomplete overview

The Sicilian GRID

- Talking about the history of science in Sicily means to go back in time at least 25 centuries.
- Do not be scared: this is not my intention!



- **BUT** at least two names among **my Ancestors**
- **Empedocles** (Agrigento, 490-430 BC)
All Universe made up with **FIRE, AIR, WATER, EARTH**
Two forces: LOVE and STRIFE, bring those elements to attraction and repulsion
- **Archimedes** (Siracusa, 287-212 BC)
Mathematician: value of π (polygons inside and outside a circle), use of infinitesimals, volume and surface of sphere and circumscribed cylinder, spirals...
Physicist: principles of lever, floating bodies
Engineer: screw (to pull up water), claw(?), heat ray (?)

Jump two thousand years

to the foundation of the Universities

Catania , Messina , Palermo

NOWADAYS

CENTRES for spreading of culture

and

SITES of excellence centers in various branches.

Universities are (**and hopefully will be**) the main centres for research, at least the basic one.

Synergies from exchange and constructive interaction between teaching young people and making research with them.

BUT strict collaboration with national research institutions and funding agencies necessary.

All the main are present in Sicily

CNR National Research Council

is the oldest and largest.

Its duty to carry out, promote, spread, transfer research activities in the main sectors of knowledge and of its applications for the scientific, technological, economic and social development.

Activities divided into macro areas of scientific and technological research: biotechnology, medicine, materials, environment, information and communications, judicial and socio-economic sciences, classical studies and arts.

Distributed all over Italy: a network of institutes.

CNR Institutes in Sicily

CITY	ACRONYM	NAME
Catania	IMM	<u>Institute for microelectronics and microsystems</u>
Messina	ITAE	<u>Institute for advanced energy technologies "Nicola Giordano"</u>
Palermo	IBIM	<u>Institute of biomedicine and molecular immunology "Alberto Monroy"</u>

INFN National Institute for Nuclear Physics

Dedicated to the **study of the fundamental constituents of matter.**

Theoretical and experimental research in the fields of subnuclear, nuclear, and astroparticle physics.

Fundamental research in these areas requires cutting-edge **technologies and instrumentation**, which the INFN develops both in its own laboratories and in collaboration with the world of industry.

These activities are conducted in close collaboration with the academic world.

INFN Structure

Two complementary types of facilities: the **Divisions (Sezioni)** and the **National Laboratories**.

19 Divisions located at University Physics Department (**one in Catania**).

The Divisions thus provide a direct connection between the Institute and the academic world.

Four Laboratories: **Catania, Frascati, Legnaro, Gran Sasso** home to major facilities available to the national and international scientific community.

AND CERN

INAF National Institute for AstroPhysics

Coordinates the **national activities** in
Astronomy and Astrophysics

It has 12 **Astronomical Observatories**
(1 in Palermo and 1 in Catania)

and 3 **Institutes** (one in Palermo)

Many international collaborations

Access to various **very large facilities**
all around the world

INGV

National Institute for Geology and Volcanology

Born in September 1999

to gather all scientific and technical institutions operating in
Geophysics and Volcanology

headquarters in Rome

important facilities in Milano, Bologna, Pisa, Napoli, Catania and
Palermo.

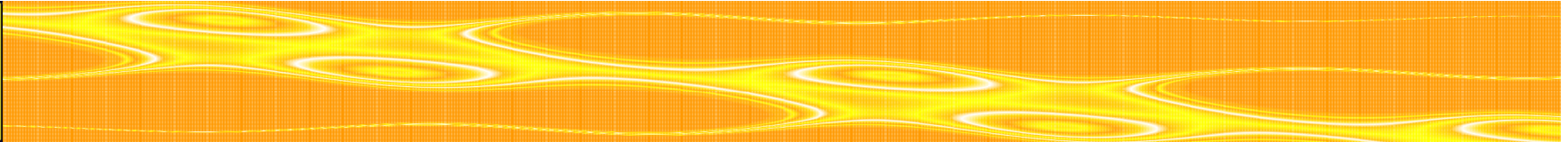
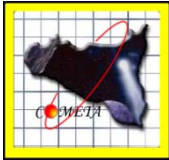
Monitoring of geophysical phenomena

24-hour countrywide seismic surveillance

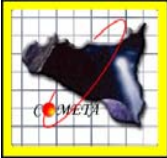
real-time volcanic monitoring

early warning and forecast

the data supplied by numerous monitoring networks are regularly distributed to the public institutions concerned, to the scientific community and to the public.



THE SICILIAN GRID



The COMETA Consortium

(www.consorzio-cometa.it)

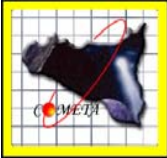
- Titolare del progetto Pi2S2 (PON “Ricerca” 2000-2006)



- Major research institutions active in Sicily

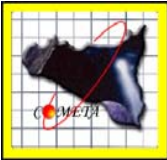
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Pi2S2 / Goals of an e-Infrastructure in Sicily

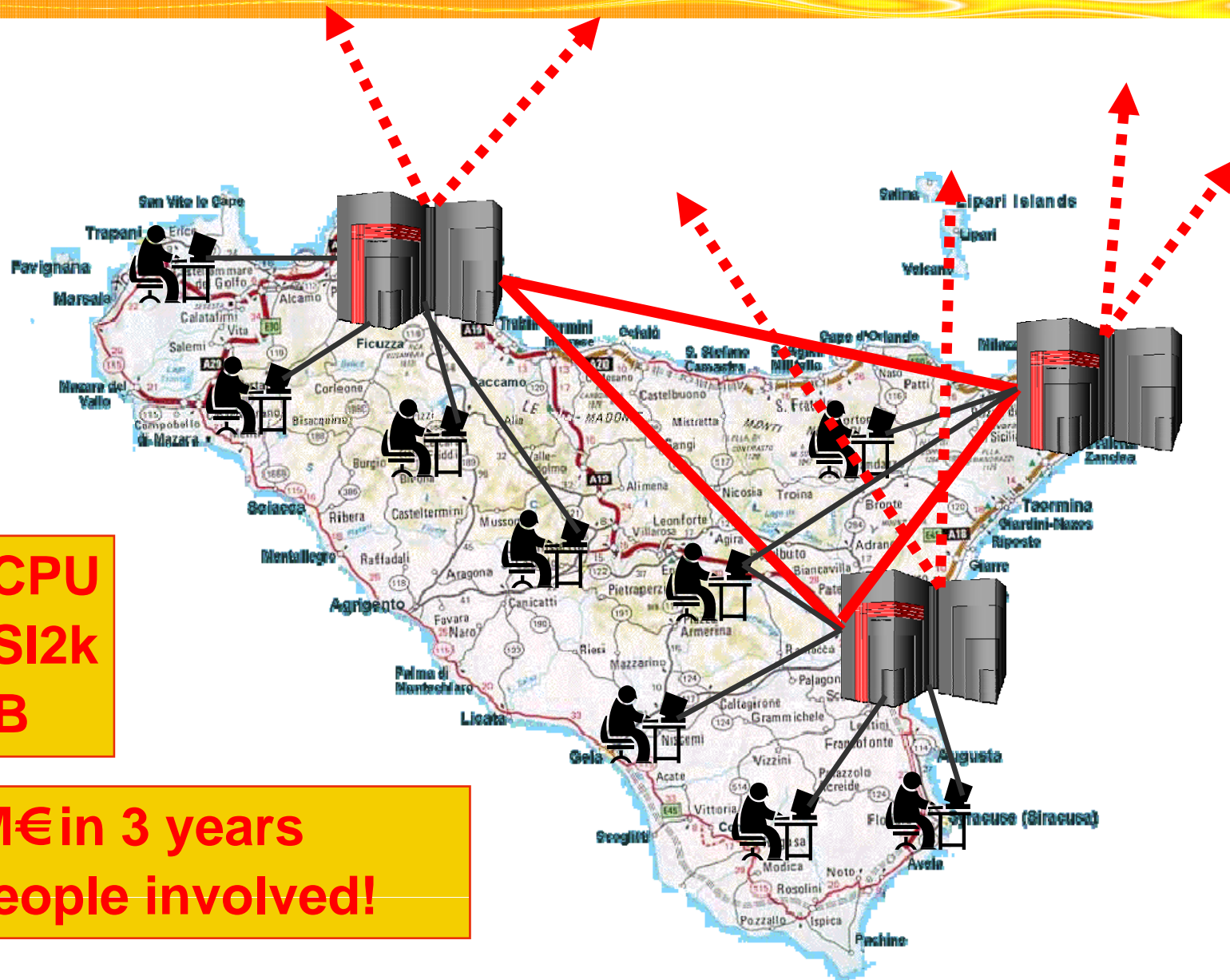
- **Create a Virtual Laboratory in Sicily**
 - both for scientific and industrial applications
 - supported by Grid infrastructure also targeting HPC
- **Connect the Sicilian e-Infrastructure**
 - to those already existing in Italy, in Europe, and the world
- **Improve the scientific collaboration**
- **Disseminate the “grid paradigm” through dedicated events and training courses**
- **Increase the “competitiveness” of e-Science and e-Industry “made in Sicily”**
- **Trigger/foster the creation of spin-offs in the ICT area**
- **Tackle the “brain drain” to northern Italy and beyond**



Pi2S2 / The Sicilian Grid at a glance

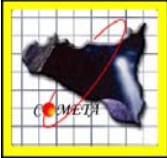


Ministero
dell'Università e della Ricerca



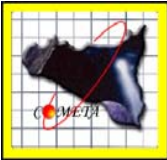
~2000 CPU
~3.2 MSI2k
~250 TB

~11.3 M€ in 3 years
>270 people involved!



WP4 fields of interest: ranging over e-science

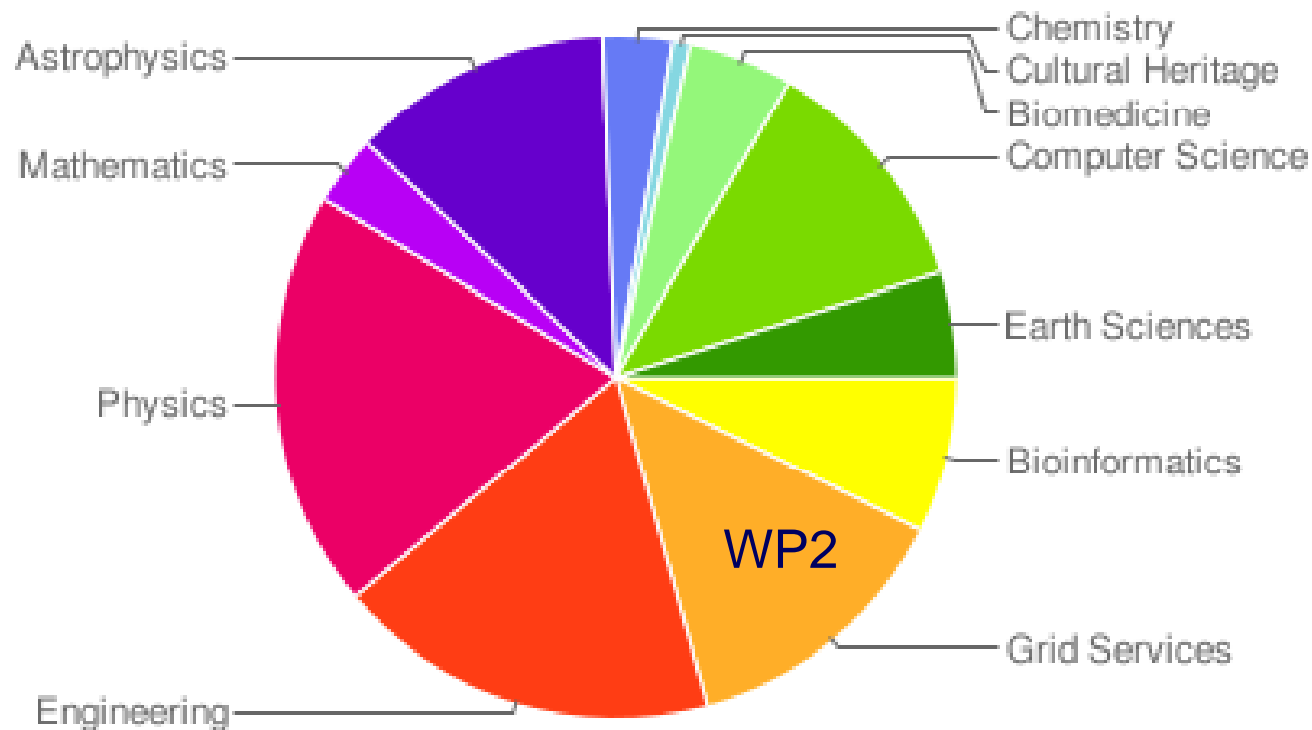
- **Astrophysics**
- **Physics**
- **Chemistry**
- **Earth Sciences**
- **Engineering**
- **Mathematics**
- **Computer Science (Grid applications)**
- **Cultural Heritage**
- **Biomedicine**
- **Bioinformatics**



WP4: Pi2S2's Applications

- A volume published by COMETA is available at:
 - indico.ct.infn.it/materialDisplay.py?materialId=12&confId=24
- A comprehensive online database is available at:
 - <http://www.pi2s2.it/applications> (**122** entries as of today)

Distribution by domain





WHAT NEXT ?



The GRISÙ Organisation

(www.grisu-org.it)

- Established in September 2007 to:
 - Setup;
 - Interconnect (through GARR);
 - Interoperate;
 - Manage



a Grid-enabled and HPC-capable e-Infrastructure (~8,000 CPU cores and ~0.5 PB of storage, altogether) in the South of Italy for Research & Development & Innovation



The “ultimate” Network of GRISÙ

