



*"Scientific thought is the common
heritage of humankind."*

Abdus Salam

ICTP founder Abdus Salam



- ICTP is an institution that is run by scientists for scientists to support the best science possible, with special attention paid to the needs of scientists from developing countries



ICTP mission

Conducting research at the highest international standards, ICTP's mission is:

- To foster growth of advanced physics and mathematics studies, especially in developing countries
- To develop high-level scientific programmes and encourage international scientific exchange
- To provide excellent research and training facilities



Quick facts

- Founded in 1964 by Nobel Laureate Abdus Salam
- Sponsored by tripartite agreement between Italy, UNESCO and IAEA
- Attracts visiting scientists mainly from developing and least developed countries
- Provides training to improve scientific capacity in developing countries





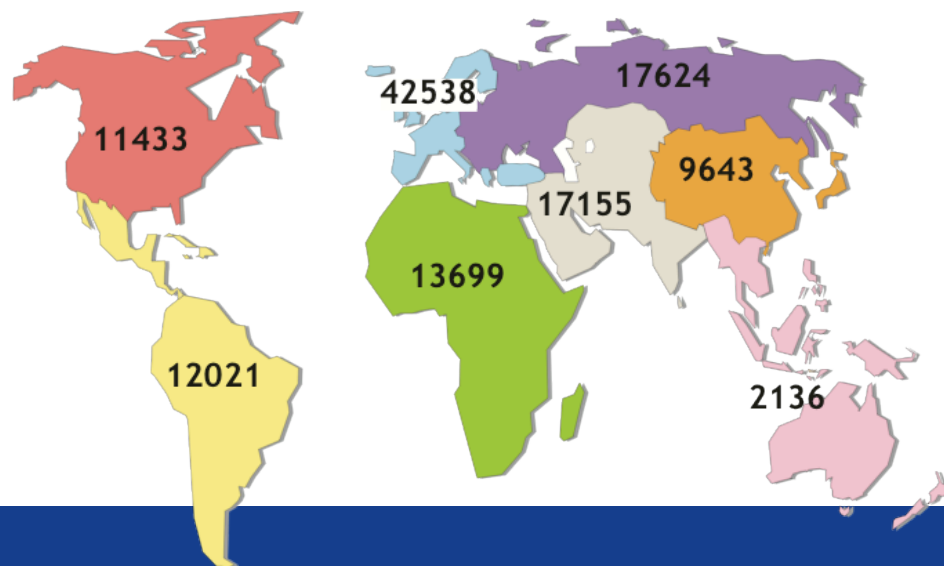
ICTP visiting scientists

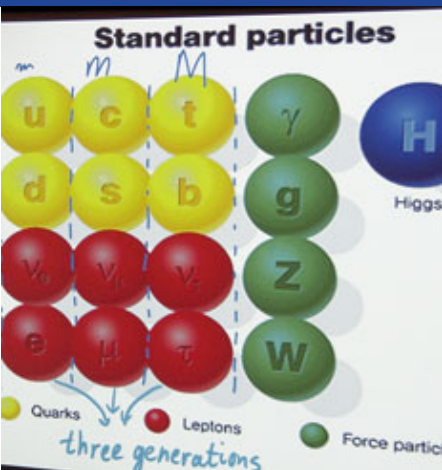
- More than 120,000 visits since 1970
- 184 countries represented
- 20% of ICTP visiting scientists are women



Number of visits by scientists from:

- North America
- Latin America
- Western Europe
- Eastern Europe
- Africa
- Middle East and South East Asia
- Far East
- South East Asia and the Pacific





Research at ICTP

- High Energy, Cosmology and Astroparticle Physics
- Condensed Matter and Statistical Physics
- Mathematics
- Earth System Physics





Research at ICTP

- 30 staff scientists, 6 staff associates, 70 post docs and long-term visitors, 14 consultants
- Research support
 - ICTP Library holdings include 68,500 books, 320 journal subscriptions and 4,200 e-journals
 - State-of-the-art computer cluster and support
 - Publications and printing unit
 - Open access to e-journals, and digital lectures
 - African Review of Physics



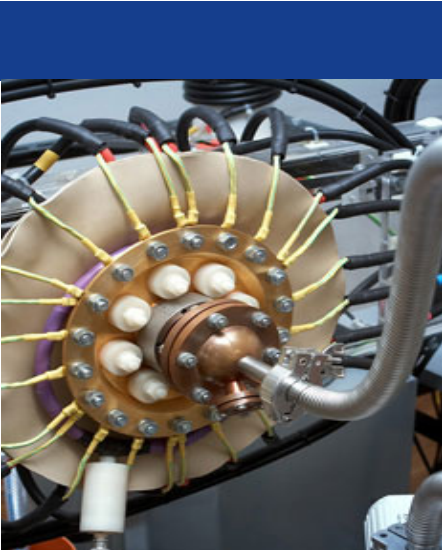
ICTP training and education

- Provides training and skills to scientists from developing countries
- ITCP organizes more than 60 conferences/workshops each year
- Welcomes 4,000 to 5,000 scientists from about 130 nations each year
- Attracts an additional 1,000-2,000 scientists/year through hosted activities



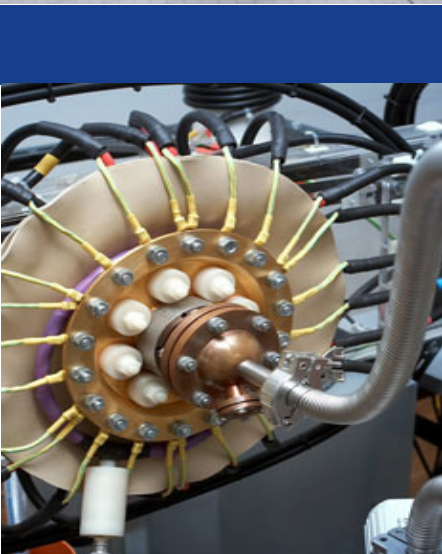
Diploma Programme

- Pre-PhD Diploma Programme: 1-year intense pre-PhD programme.
- Two streams: Physics of Solid Earth / Physics of Climate.
- Students work on a research thesis with an ICTP supervisor.
- Many of our students have been accepted for PhD in US and European Universities.
- <http://diploma.ictp.it/courses/esp.aspx>



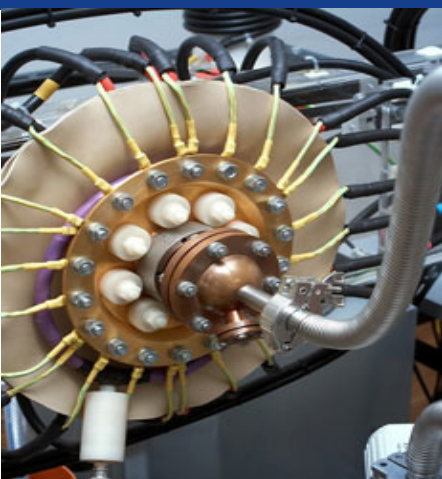
Joint Master in Physics

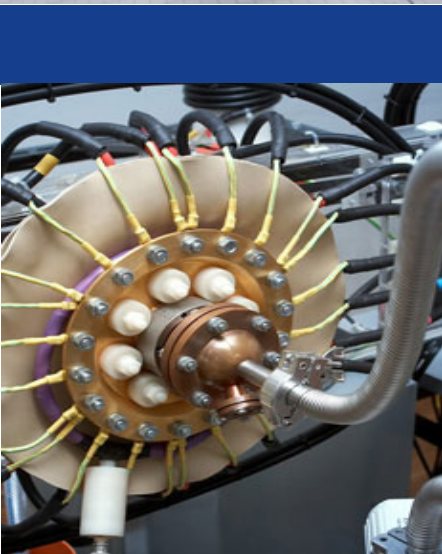
- International study programme, to provide graduate training to young promising physics students, within a two-year Masters Degree in Physics.
- The Masters Degree in Physics can be compared to an advanced masters in physics or in astrophysics in the Anglo-Saxon system.
- The Masters Degree covers two academic years. Courses are held in English and are delivered by scientists belonging to the Universities of Trieste and ICTP.



MSc in HPC

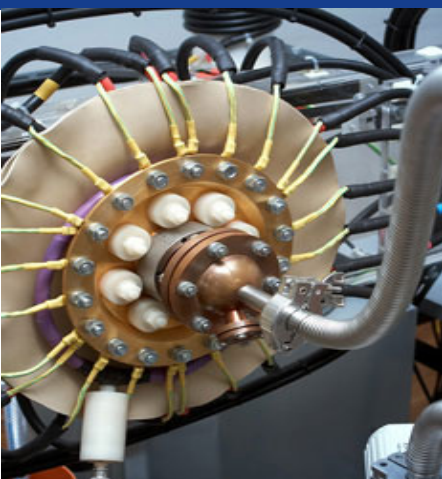
- Master in High Performance Computing (MHPC)
- Lecturers from ICTP, SISSA, CINECA.
- MHPC provides skills useful both in the academic and in the industrial field, like technical and software development.
- The program combines lectures with hands-on and applied projects to prepare future HPC specialists for academia and industry.
- <http://www.mhpc.it/>





STEP Programme

- Sandwich Training Educational Programme (STEP): fellowships to PhD students from developing countries in the fields of physics and mathematics.
- With a STEP fellowship, PhD students study at their home universities but have the financial support to visit ICTP or a collaborating institute for a three- to six-month stay each year for three successive years.
- Fellows work on their PhD theses with their advisors at their home institutes and co-advisors at the hosting institutes. Their PhD is awarded at their home institutes.



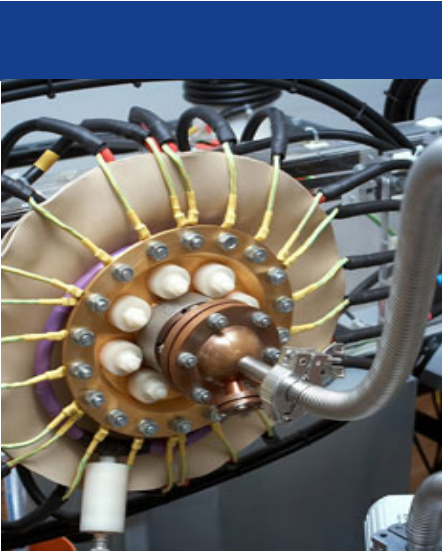
OFID Programme

- **OFID Postgraduate Fellowship:** ICTP and the OPEC Fund for International Development (OFID) offer fellowships and training opportunities to PhD students in developing countries. The OFID Postgraduate Fellowships supports 15 doctoral students to access ICTP research/training facilities for up to six months per year for three consecutive years. Fellows will carry out research/training towards their PhD within the STEP scheme at ICTP
- <http://ofid.ictp.it/>

PhD Programme

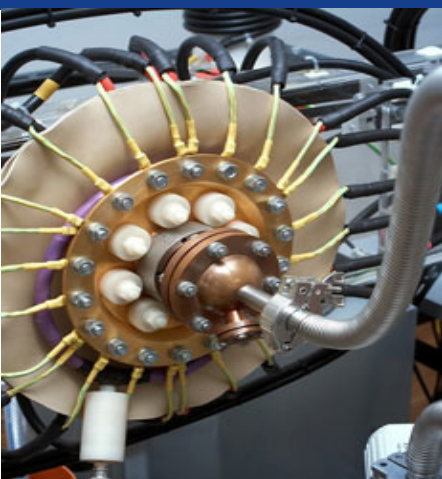
➤ Joint PhD Programme Earth Science and Fluid Mechanics with Trieste University

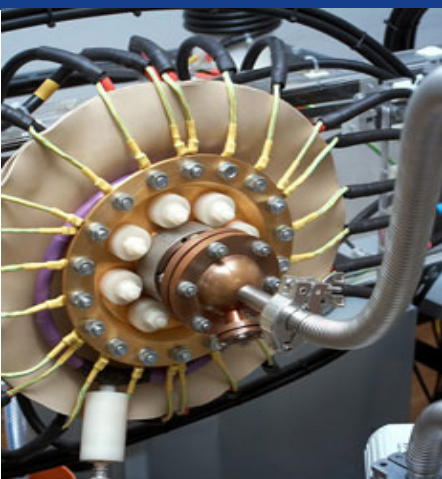
- 3-year PhD programme.
- Courses in common with ICTP Diploma, Math. Dept, Engineering Dept.
- Funding comes from Trieste U., Italy, EU sources, ICTP.
- <http://www.phdfuidmechanics.units.it/>



Office of External Affairs

- To initiate, stimulate or make applicable research and training in the fields of physics and/or mathematics
- To form and strengthen national and regional communities and research groups by supporting institutions or national societies
- To enhance physics and mathematics teaching.
- Funds PhD fellowships.
- <https://www.ictp.it/programmes/outreach-activities/office-of-external-activities.aspx>





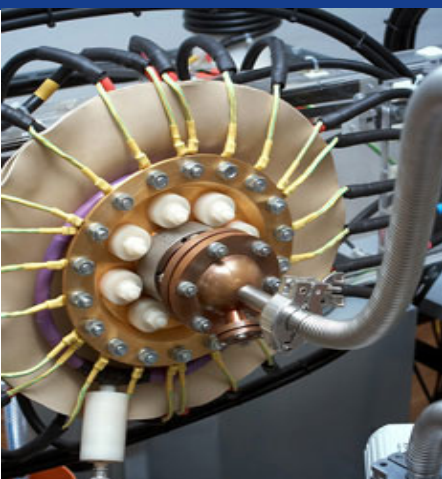
TRIL Programme

- Training and Research in Italian Laboratories (TRIL)
- The TRIL Programme offers scientists from developing countries the opportunity to undertake training and research in an Italian laboratory in different branches of the physical sciences.
- Since 1983, **1328** scientists from developing countries have taken advantage of opportunities to participate in high level research in active Italian teams.

Associate Programmes

➤ Associate Schemes

- Junior: promising young scientists up to the age of 35. 6-year appointment, during which associate visits ICTP three times for stays of between 30 and 60 days each.
- Regular: Scientists aged between 36 and 45.
- Senior: intended for scientists, over the age of 45, from and working in developing countries. 6-year appointment; unlimited visits of up to 60 days each.





The Abdus Salam
International Centre
for Theoretical Physics



IAEA
International Atomic Energy Agency

... and it is also a nice place to visit ...





SOCIETY

DEVELOPMENT

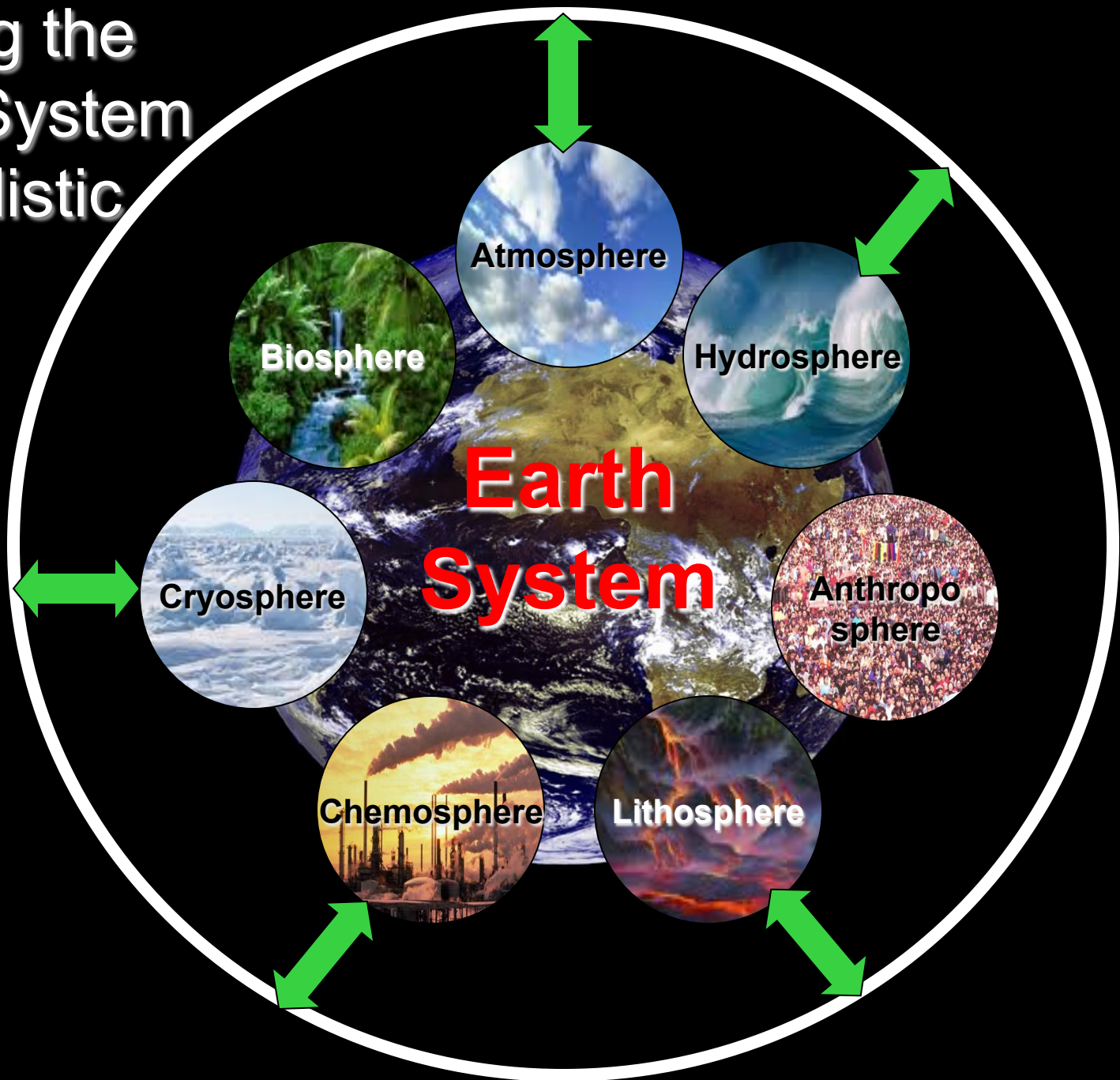
Earth System Physics Section (ESP)

ENVIRONMENT

ESP 2016 at a glance

- 7 Scientific staff: Giorgi, Aoudia, Coppola, Kucharski, Solmon, Tompkins, Farneti
- 18 Long term visitors and postdoctoral fellows
- ~10 staff associates
- 5 PhD and step students
- 55 Peer reviewed publications
- 10 Activities
- Diploma program with 10 students

Viewing the
Earth System
in a holistic
way



ESP Main Research Areas

**Computational Earth
System modeling**

**Anthropogenic
Climate Change**

**Natural climate
dynamics and variability**

**Climate impacts on
society and ecosystems**

**Seasonal to interannual
climate predictability**

**Research,
Networking,
Education**

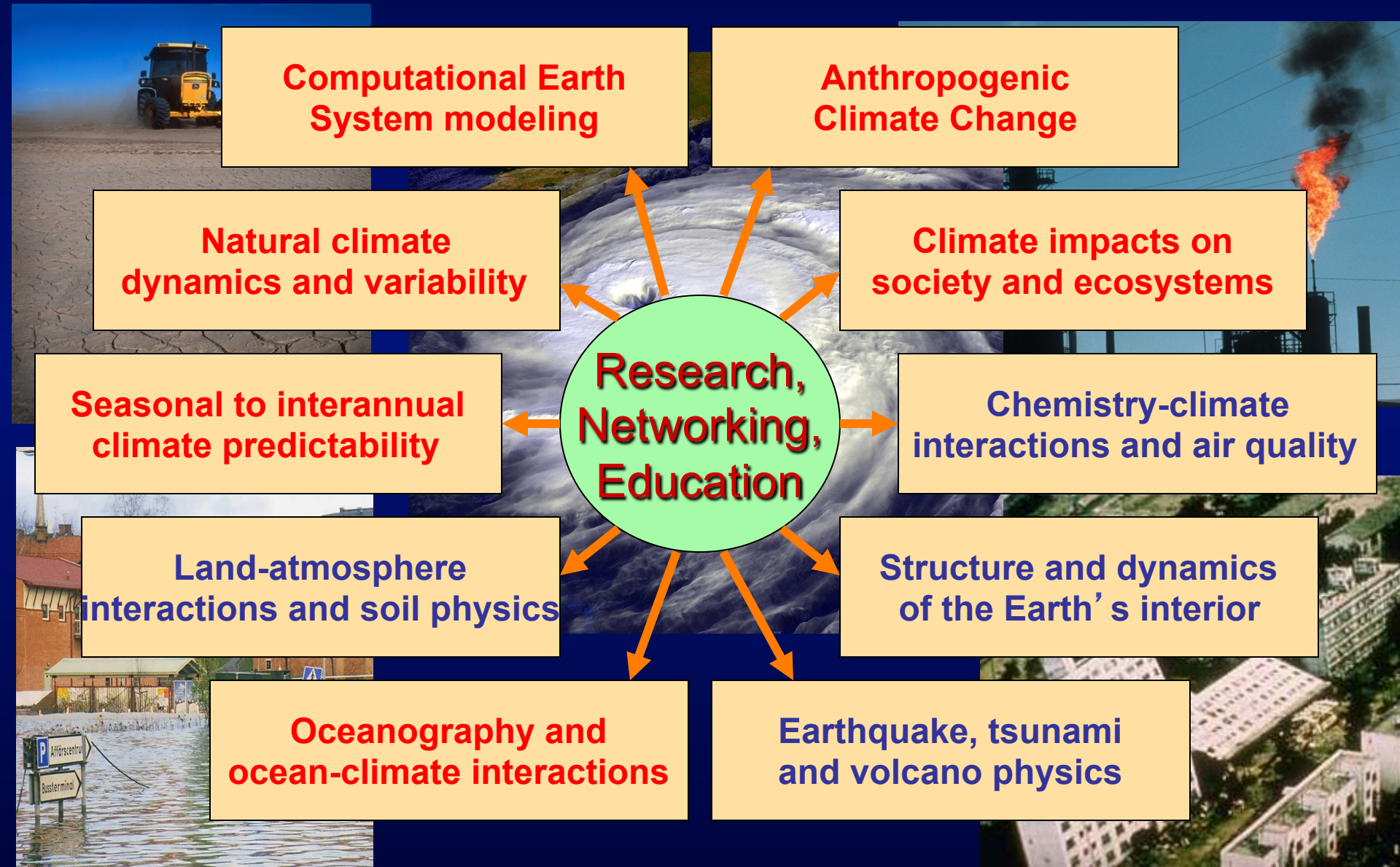
**Chemistry-climate
interactions and air quality**

**Land-atmosphere
interactions and soil physics**

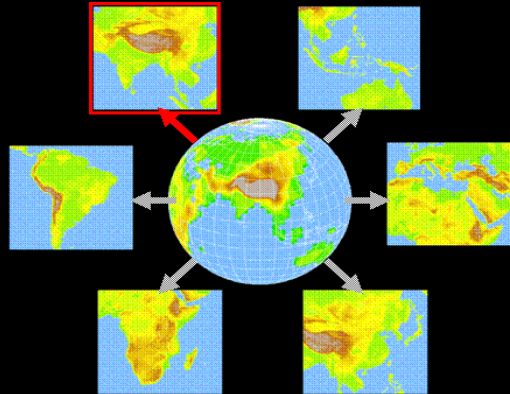
**Structure and dynamics
of the Earth's interior**

**Oceanography and
ocean-climate interactions**

**Earthquake, tsunami
and volcano physics**

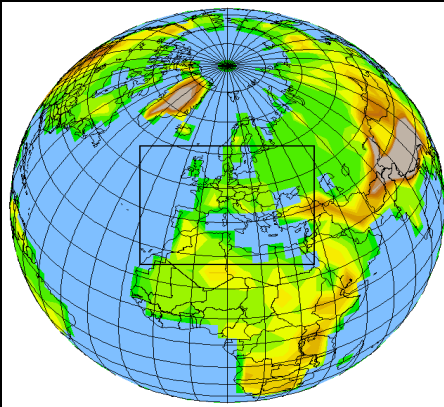


Computational Earth System modeling



**Regional Earth System
Modeling (RegCM)**

**Global Earth System
Modeling
(SPEEDY, MOM)**



***Coupled Ocean-Atmosphere
Model
SPEEDY-(NEMO/MOM)
RegCM-MITgcm***



**Computing resources:
Local cluster (ARGO)
SISSA cluster
CINECA HPC cluster
ECMWF**

ESP Areas of research

<http://www.ictp.it/research/esp.aspx>

- Climate Variability:
Mechanisms, Variability, Predictability and Change
- Ocean Dynamics & Modelling:
role of the ocean in climate
- Atmospheric physics & Chemistry:
Climate Applications
- Regional Atmospheric Modelling: CORDEX program
- Geophysics: Seismology, physics of volcanoes

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