

*The Abdus Salam*  
**International Centre for Theoretical Physics**



# **International School on Geothermal Exploration**

**jointly organized with the *International Centre for Science and High Technology*  
(ICS-UNIDO, Trieste)**

## **co-sponsors:**

**ENEL - Green Power (Italy), International Geothermal Association (IGA),  
University of Trieste & Unione Geotermica Italiana (UGI),  
the Italian National Research Council (IGG-CNR, Pisa)  
and the ICTP Training and Research in Italian Laboratories Programme (TRIL)**

## **Organizers:**

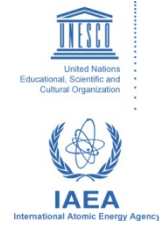
**R. Bertani (ENEL, Italy), D. Chandrasekharam (IIT-Bombay, India),  
A. Manzella, (CNR, Italy), M. Pipan (Univ. of Trieste, Italy)**

**Local Organisers: G. Furlan and A. Aoudia**

**Secretariat: Lisa Iannitti**



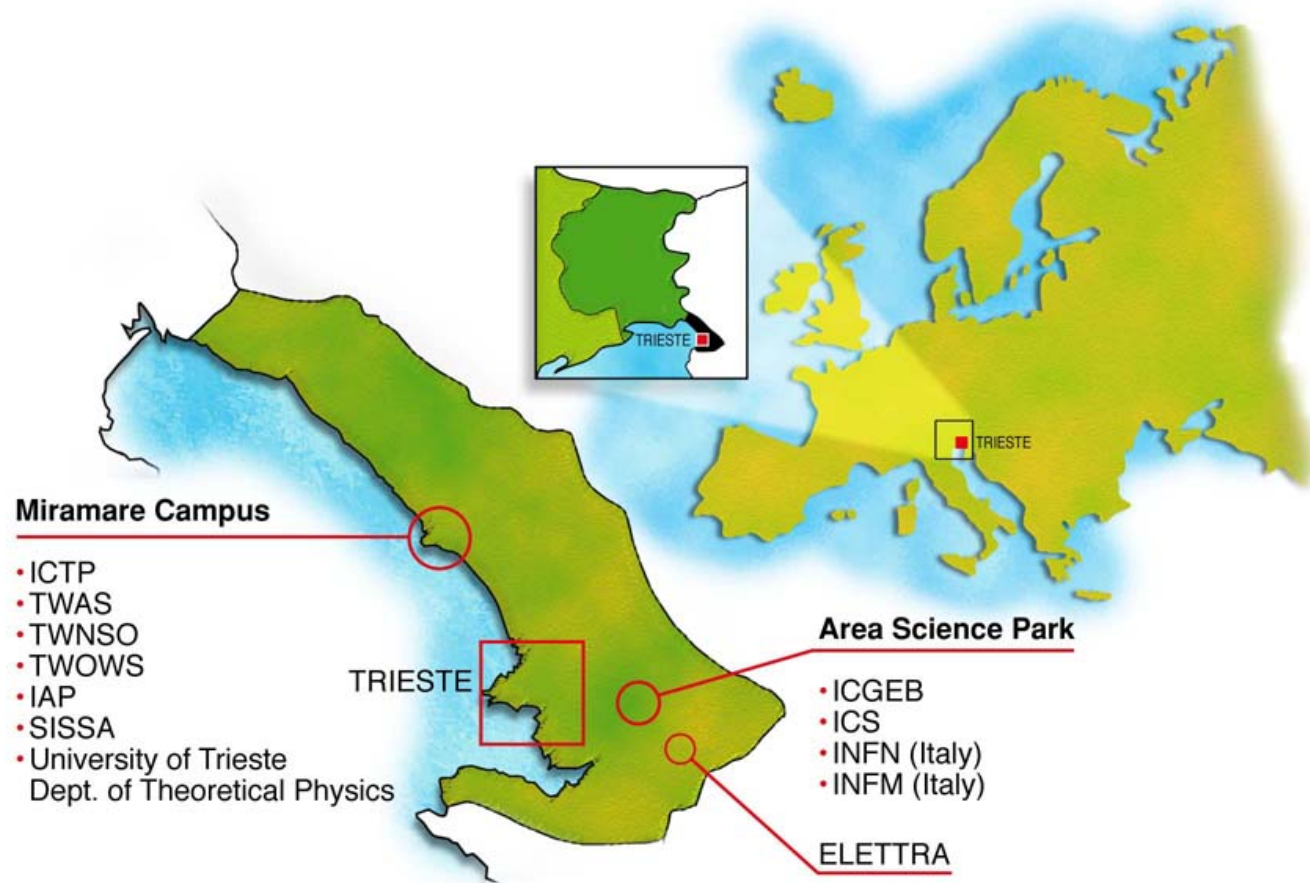
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# ICTP Overview

**A. Aoudia**  
**Earth System Physics Section**  
**[aoudia@ictp.it](mailto:aoudia@ictp.it)**

# Trieste system





## ICTP mission

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

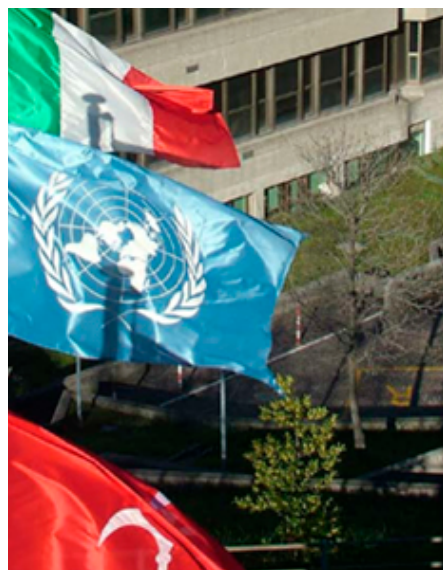
- > **Capacity Building:** To foster growth of advanced physics and mathematics studies, especially in developing countries
- > **International Collaboration:** To develop high-level scientific programmes and encourage international scientific exchange
- > **Research Excellence:** To conduct research at the highest international standards and maintain 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 transition countries
- > Provides training to improve scientific capacity in developing countries

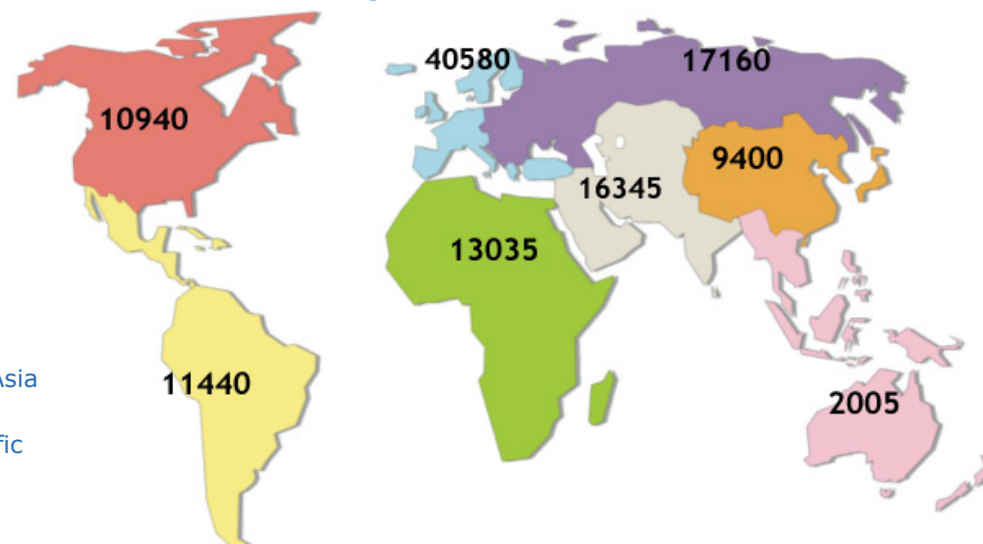






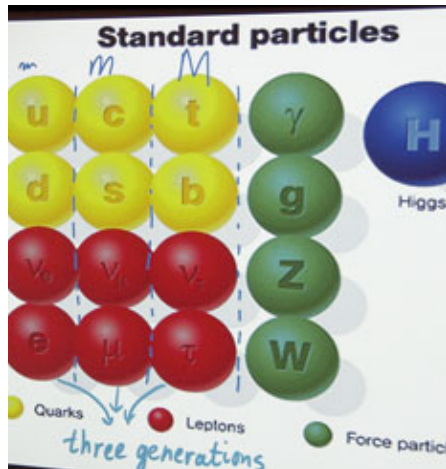
## ICTP visiting scientists

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



**60% from developing countries  
40% from developed countries**

## Research at ICTP



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





## Research support at ICTP

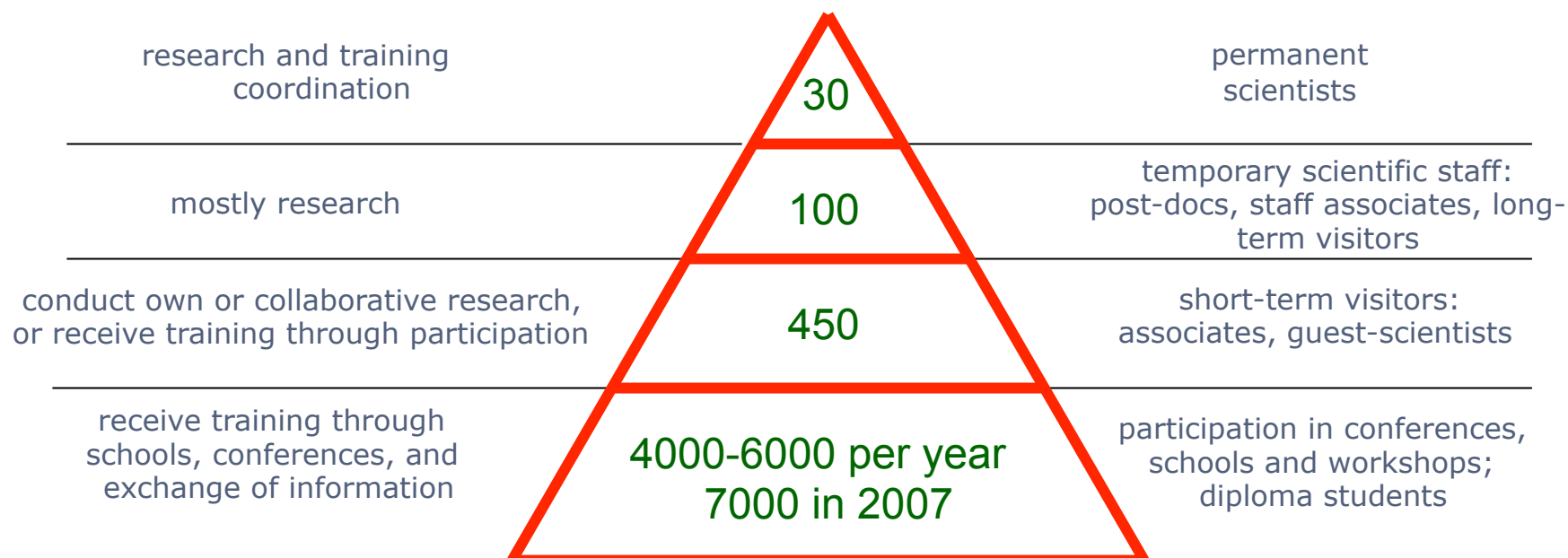
- > ICTP Library holdings include 68,000 books, 340 journal subscriptions and 4,000 e-journals. The ICTP library hosts the eJDS (Electronic Journals Delivery Service)  
<http://library.ictp.it/ejds>
- > State-of-the-art computer equipment and support
- > Publications and printing unit
- > Open access to e-journals, and digital lectures





## ICTP Scientists, Visitors and their Functions

**ICTP is an institution run by a few scientists for the benefit of many**





## ICTP training and education

- > Provides training and skills to scientists from developing countries
- > Organises more than 60 Schools/workshops/conferences each year
- > Maintains multimedia iTunes U site
- > 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

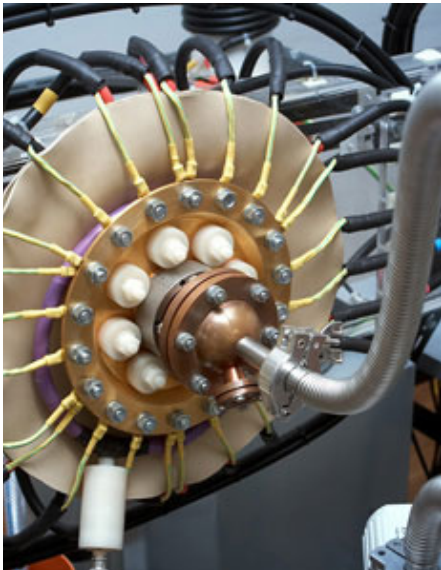




## ICTP training and education

### > Postgraduate programmes

- Postgraduate Diploma Programme
- Postgraduate Diploma Programme in General Physics
- ICTP Sandwich Training Educational Programme





## ICTP Training and Education

### > Degree Programmes

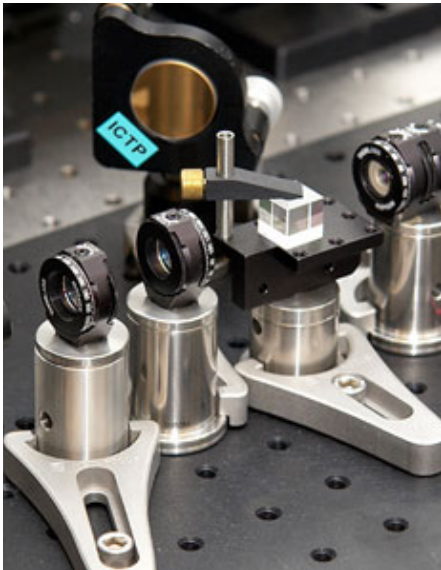
- PhD in Physics or Mathematics
- PhD in Fluid Mechanics
- Laurea Magistralis (Master's) in Physics





## ICTP training and education

- > Scientific career support:
  - > ICTP visitors' programme
  - > Associate and Federation Schemes
  - > Training and Research in Italian Laboratories







## ICTP training and education

### > Office of External Activities

- Supports scientific activities in developing countries
  - PhD courses
  - Scientific meetings
  - Regional networks
  - Affiliated centres





## for individuals

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- Use the ICTP training opportunities:
  - Associate and federation scheme: <http://portal.ictp.it/assoc>  
deadline :30 September of each year
  - Diploma Program: <http://diploma.ictp.it>, deadline: 31 December of each year
  - STEP PhD Sandwich Program:  
[http://users.ictp.it/www\\_users/STEP/STEP.html](http://users.ictp.it/www_users/STEP/STEP.html), deadlines: 15 February and 15 August of each year.
  - Training and Research in Italian Laboratoris ICTP-TRIL:  
<http://portal.ictp.it/tril/>



# Diploma Programme

diploma.ictp.it

An intense 12 month pre-PhD educational programme of the ICTP for talented young science students from developing countries. The Diploma Programme is made of four specialized fields, reflecting the core research activities of the ICTP sections (Condensed Matter, Earth System Physics, High Energy Physics & Mathematics) and one field in Basic Physics designed to students from sub-Saharan Africa, with an intense and comprehensive revision of undergraduate physics.



# Diploma Programme in Earth System Physics

## 1-year intensive pre-PhD course

- First Term:
  - Introduction to the Physics of the Earth System
  - Mathematical Methods in Geophysics
  - Fluid mechanics and GFD
  - Wave Physics
  - Thermodynamics
  - Advanced Statistics
  - Numerical Methods I
  - Readings in Geophysics
- Second Term:
  - Earth System Remote sensing
  - Seismology
  - Mechanics of Earthquakes and volcanic eruptions
  - Physics of the Atmosphere
  - Hydrology
  - Climate dynamics
  - Bio-geochemical cycles
  - Physics of the Oceans
  - Environmental data analysis
  - Numerical Methods II
  - Readings in Geophysics

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# for Partnerships


(form and strengthen national/regional communities  
and research groups)

Education: ICTP promotes initiatives aimed at "**training for research**" of young scientists. An OEA **Project** offers scientific advice and financial support towards the establishment of new Ph.D courses at universities in the less developed countries. A Project may also provide support towards fellowships for young scientists from less developed countries to work in institutions in more advanced developing countries in their region. These are often organized on the basis of cooperation agreements between the ICTP and those institutions.

More info on <http://oea.ictp.it/>



# for Partnerships



(form and strengthen national/regional communities  
and research groups)

Science: A **Network** is a system of research groups in an entire region, or among different regions, that pursues a common scientific project over an extended period. The network program represents an efficient approach to overcoming the problem of isolation and counteracting the "brain-drain" of scientists in the Developing World.

The proposer of the network is expected to act as co-ordinator and his/her Institution as headquarters. A network may organize seminars or workshops, arrange for visiting scientists and maintain joint links with the rest of the international scientific community.

More info on <http://oea.ictp.it/>



# for Partnerships

(form and strengthen national/regional communities  
and research groups)

A **Project** and a **Network** could also be the preliminary phase leading eventually to a an **Affiliated Centre**.

An ICTP Affiliated Centre (ICAC) is an Institute or University Department or Observatory that agrees to carry out a specific long-term research project on a definite subject with well defined purposes. An ICAC is expected to have a regional character and to be strongly supported by the local authorities and the hosting Institution.

Many scientists participate in ICAC activities. Consistent with such collaboration, an ICAC scientific advisory board is normally formed.

More info on <http://oea.ictp.it/>



**“SCIENTIFIC THOUGHT IS THE COMMON HERITAGE OF MANKIND”**

*Abdus Salam*

*Founding Director 1964-1994*

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

