



The Abdus Salam  
International Centre  
for Theoretical Physics  
50th Anniversary 1964–2014



# A brief introduction to the ICTP and the T/ICT4D

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# The Abdus Salam ICTP



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

*Abdus Salam*

ICTP founder Abdus Salam

ICTP is an institution run by scientists for scientists to support science development, with special attention paid to the needs of researchers from developing countries

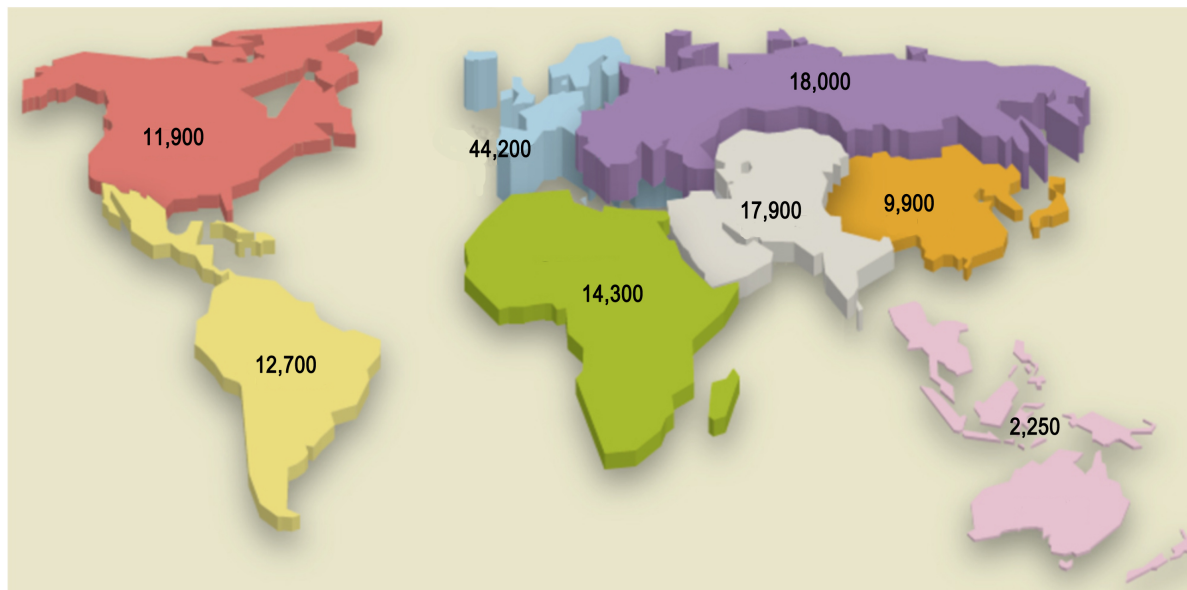
# ICTP Mission



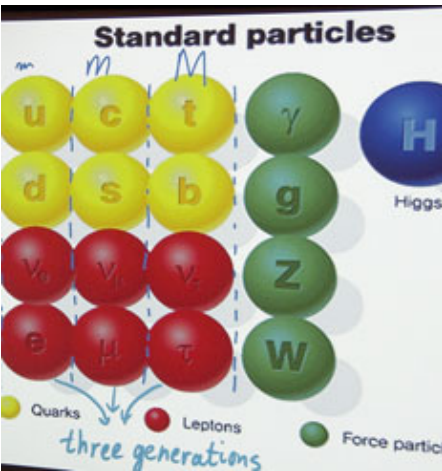
- To foster growth of advanced pure and applied physics and mathematics studies, especially in developing countries
- To develop high-level scientific programmes and encourage international scientific exchange
- To provide in-house excellent research and training facilities

# Quick facts

- Founded in 1964 by Nobel Laureate Abdus Salam
- Sponsored by tripartite agreement between Italy, UNESCO and IAEA
- More than 120,000 visits since 1970
- 184 countries represented
- 20% of ICTP visiting scientists are women



# Research at ICTP



Main:

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

Other Research activities:

- Multidisciplinary Laboratory
- Telecommunications/ICT for Development Laboratory (former ARPL)
- Renewable Energy (*new*)
- High Performance Computing (*new*)
- Quantitative Biology (*new*)



# ICTP training and education



- 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.





# Training activities around the world



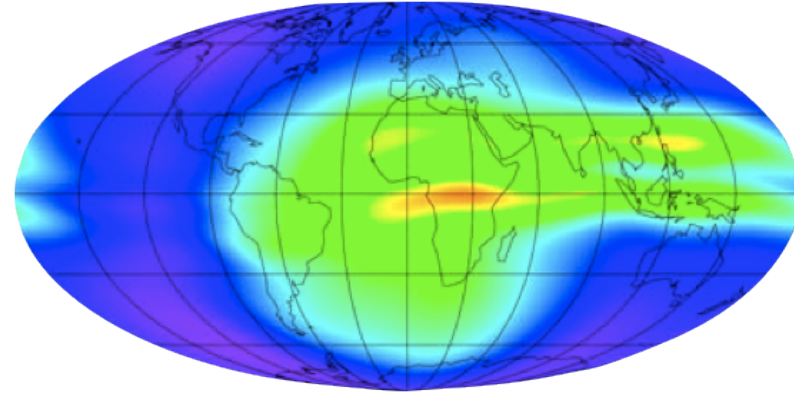
-  Locations in 2013
-  Locations in 2012

# T/ICT4D (former ARPL): two units



## ■ Ionospheric Radiopropagation (since 1990):

*research and training in ionospheric physics  
and application to GNSS science and  
technology*



## ■ Wireless communications (since 1995):

*research and training in Wireless ICT  
including Wireless Sensors Networks for  
Development and Internet of Things*

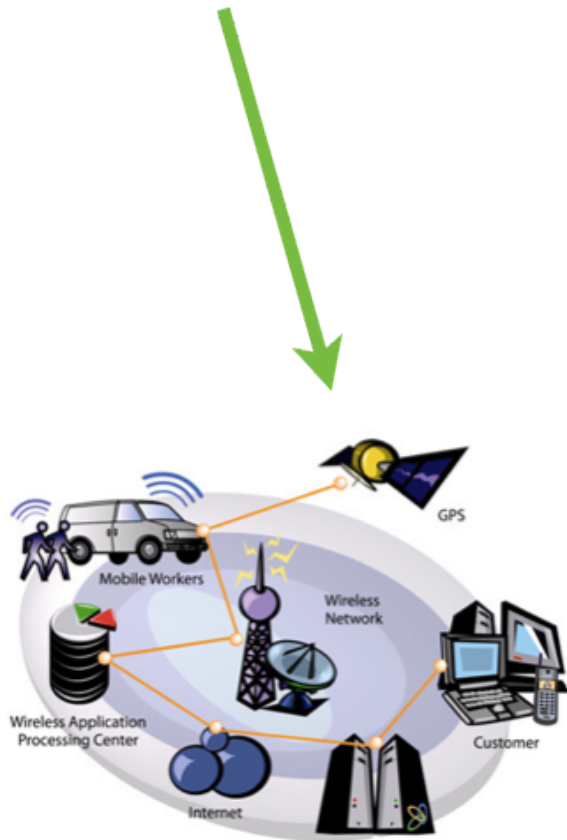




# Why these two sections together ?



***Today trend***



***Combined uses of GNSS  
(GPS, GLONASS,  
Galileo, Compass, etc.)  
and Information and  
Communication  
Technology (ICT)***

***Location Based Services***

# Activities in Ionospheric Radiopropagation



- From **1999** ionospheric modeling efforts of the Laboratory became strongly oriented towards trans-ionospheric propagation effects related to Global Navigation Satellite Systems (GNSS) needs.
- The Laboratory coordinated the **IET** of **ESA** supporting **EGNOS** project, since the same year.
- The work of the Laboratory was related also to **GALILEO** programme since **2000**.
- In-house on-going research and training on ionospheric effects on GNSS operations in the framework of **ESA** and **EC** projects.



# Activities in Ionospheric Radiopropagation (cont.)



- Collaboration on ionospheric research with the “*Ionospheric Studies and Satellite Positioning*” group of **Universidad Complutense of Madrid**.
- Other academic collaboration with Universities in **Russia, Argentina, Nigeria, Uganda, Ethiopia, Kenya**.
- Partnership with the **ISR** of **Boston College** (USA) to promote and support **GNSS** related science and applications in Africa (training and academic support including instruments).
- Collaboration with **ICG** to train in **GNSS** science and applications.

# A series of Training Activities



*4 December - 15 December, 2006*

**Workshop on the Future of  
Ionospheric Research for Satellite  
Navigation and Positioning: its  
Relevance for Developing  
Countries, Trieste, Italy**

*23 March - 9 April, 2009,*

**Satellite Navigation Science and Technology for  
Africa, Trieste, Italy**

*16-19 November, 2009,*

**Nigerian National Meeting on GNSS Science  
and Applications, Abuja, Nigeria,**

*10-13 January, 2010,*

**Workshop on the Ionosphere and its Effects on  
GNSS Systems, Cairo/Alexandria, Egypt**

*19-23 July, 2010,*

**East, Central and Southern African GNSS and  
Space Weather Workshop, Nairobi, Kenya**

*6 April - 23 April, 2010*

**Second Workshop on Satellite Navigation  
Science and Technology for Africa, Trieste, Italy**

*11 April - 1 May, 2012,*

**Workshop on Science Applications of GNSS  
in Developing Countries, followed by the  
Seminar on Development and Use of the  
Ionospheric NeQuick Model, Trieste, Italy**

*6 -17 May 2013,*

**Workshop on GNSS Data Application to Low  
Latitude Ionospheric Research, Trieste, Italy**



# Activities in Wireless Communications



- ♦ **Long distance Wi-Fi:** low-cost wireless solution to link sites at long distance.
- ♦ **Training:** high level theoretical and hands-on training of trainers in the field.
- ♦ **Internet of Things:** particularly oriented to environmental monitoring applications.
- The “**Guglielmo Marconi Wireless Laboratory**” is the main experimental facility for training and research.







THANK YOU FOR YOUR  
ATTENTION