

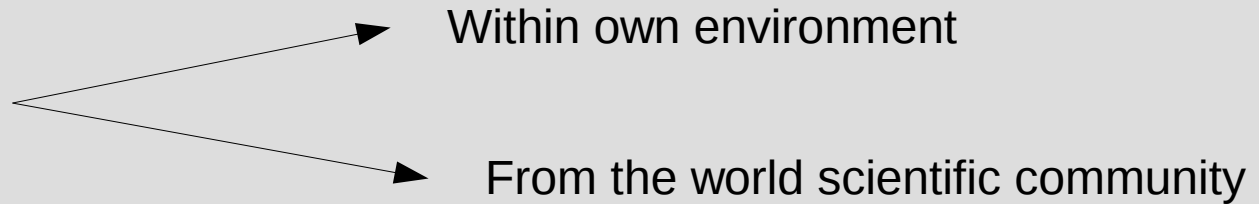


# **Regional Networking: An Integral Part of a Broader Strategy**

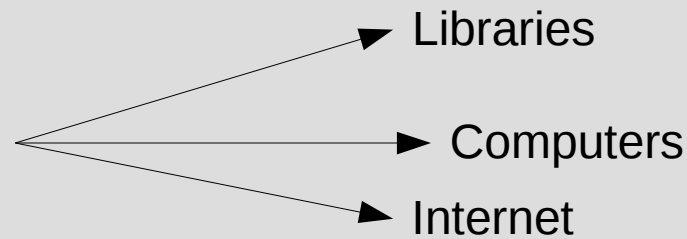
**1-4 September 2009,  
Addis Ababa Ethiopia**

# Problems Facing Scientists in Developing Countries

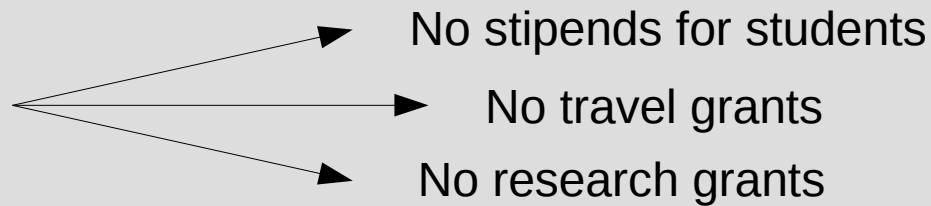
- Isolation



- Lack of Infrastructure



- Lack of Gov. Support



# Which Too Often Leads To ...

- Work on Marginal Topics
  - Stop Work Altogether
- Go Somewhere Else

# What Role Does Regional Networking Play?

Thematic Networking Bridges in part:

- Isolation
- Experimental Facilities
- Student Teaching
- Library Resources
- Internet Connectivity
- Gov. Awareness
- Sustainability

# But in Themselves Networks...

- Do not remove International Isolation
- Do not guarantee stipends for students
- Do not guarantee an increasing quality of research

...

- And fundamentally do not address the initial problems of forming scientists or keeping them there in the first place.

# Networks Are, However,

- An integral and rather essential component of an overall strategy and
- In a recent evaluation of mathematics in Africa the IMU recommended to 'strengthen and expand successful training and research activities, **especially** regional networks of people and institutions'



# The Overall Strategy of the ICTP

Sustainability is achieved only through a combination of cohesive programmes

- Forming Scientists
- Supporting them on the ground
- Research at the ICTP

# Forming Scientists

- Diploma Programmes at the ICTP
- TRIL Programme in Italy
- STEP Programme in Trieste
- M.Sc. Programmes
- Ph.D. Programmes

# Forming Scientists

- Diploma Programme (since 1991)  
Condensed Matter Physics, Earth System Physics, High Energy Physics and Mathematics
- Basic Physics Diploma (since 2008)  
Sub Saharan Students only

# Diploma 2008

43 (out of 50) Diploma students graduated in 2008

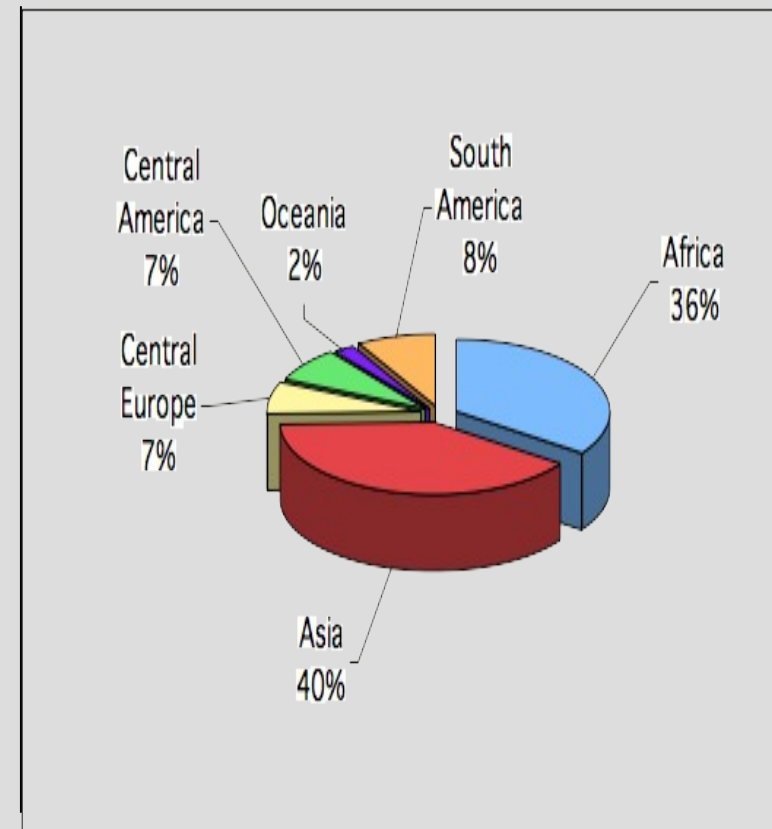
They came from:

Ethiopia (5); Iran (4); Cameroon (3), Kenya (3), Nepal (3), Nigeria (3), Vietnam (3); Bangladesh (2), Columbia (2), Senegal (2); one each from Albania, P.R. Congo, Egypt, Ghana, Indonesia, Madagascar, Mexico, Philippines, Sudan, Thailand, Uzbekistan, Venezuela and Zimbabwe

17 returned home; 8 in specialized Diploma Programmes

18 are doing graduate work at:

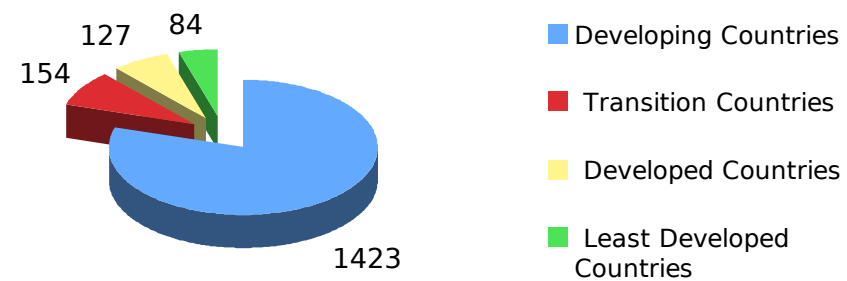
Ohio, Syracuse, Bonn, Max-Planck at Munich, Max-Planck at Leipzig, Laval Canada, Varese/Como, Dalhousie, Alberta, Memphis, Missouri, Indiana, Copenhagen, South Dakota, SISSA, Alabama, South Florida and Kaiserslauten



# Forming Scientists: TRIL Programme

## LEAST DEVELOPED COUNTRIES

COUNTRY	Grants	Fellows
Bangladesh	17	9
Burundi	3	2
DRC	4	3
Eritrea	1	1
Ethiopia	11	10
Guinea	2	2
Madagascar	5	5
Malawi	2	2
Mali	5	4
Myanmar	1	1
Nepal	4	3
Niger	2	1
Rwanda	4	2
Senegal	7	4
Sierra Leone	2	2
Somalia	7	6
Sudan	3	2
Tanzania	2	2
Zambia	3	2
<b>Total</b>	<b>85</b>	<b>63</b>



# Forming Scientists: STEP Programme

Areas covered: nuclear physics, soil physics, lasers, environmental physics, synchrotron radiation, fluid dynamics, condensed matter, high-energy physics and astrophysics.

Since the inception of the program, 86 fellows have been supported (and 20 have graduated):

41 from Africa (15 women)  
16 from Asia (8 women)  
22 from Europe (7 women)  
4 from Central America (3 women)  
3 from Latin America (1 woman)

## Host Institutions

35 ICTP  
21 Laser Lab.  
11 Elettra  
9 University of Trieste  
3 Jozef Stefan Institute, Ljubljana  
2 ICS  
1 ARPA (Regional Environmental Lab.)  
2 TASC (Nanoscience Lab.)  
1 Hospital of Udine  
1 Astronomical Observatory

# Forming Scientists: M.Sc.

- Joint Laurea in Physics with University of Trieste

<u>Year</u>	<u>App</u>	<u>Accept</u>	<u>Countries</u>
2005/2006	46	4	Ukraine, China, Uzbekistan, Cameroon
2006/2007	102	4	Armenia, Iran, Indonesia, Pakistan
2007/2008	59	3	Iran, Ethiopia (2)

- Mathematics in Botswana
- Mathematics in Pakistan
- Optics in Cape Coast
- ... and another 4 such programmes

# Forming Scientists: Ph.D. Programmes

- Fluid Mechanics at Uni. Trieste
  - 5 students have finished the first cycle and 14 more are continuing
- Mathematical Physics in Porto-Novo
- High Energy Physics in Cairo
- Lasers and Optics in Dakar
- Atomic and Molecular Physics in Yaounde
- Mathematics in Lima
- **Geo-hazards in Addis Ababa:** Just agreed to
- ... and another 11 such programmes

# Supporting Scientists on the Ground

- Affiliated Centres
- Projects
- Visiting Scholars
- Networks
- Scientific Meetings

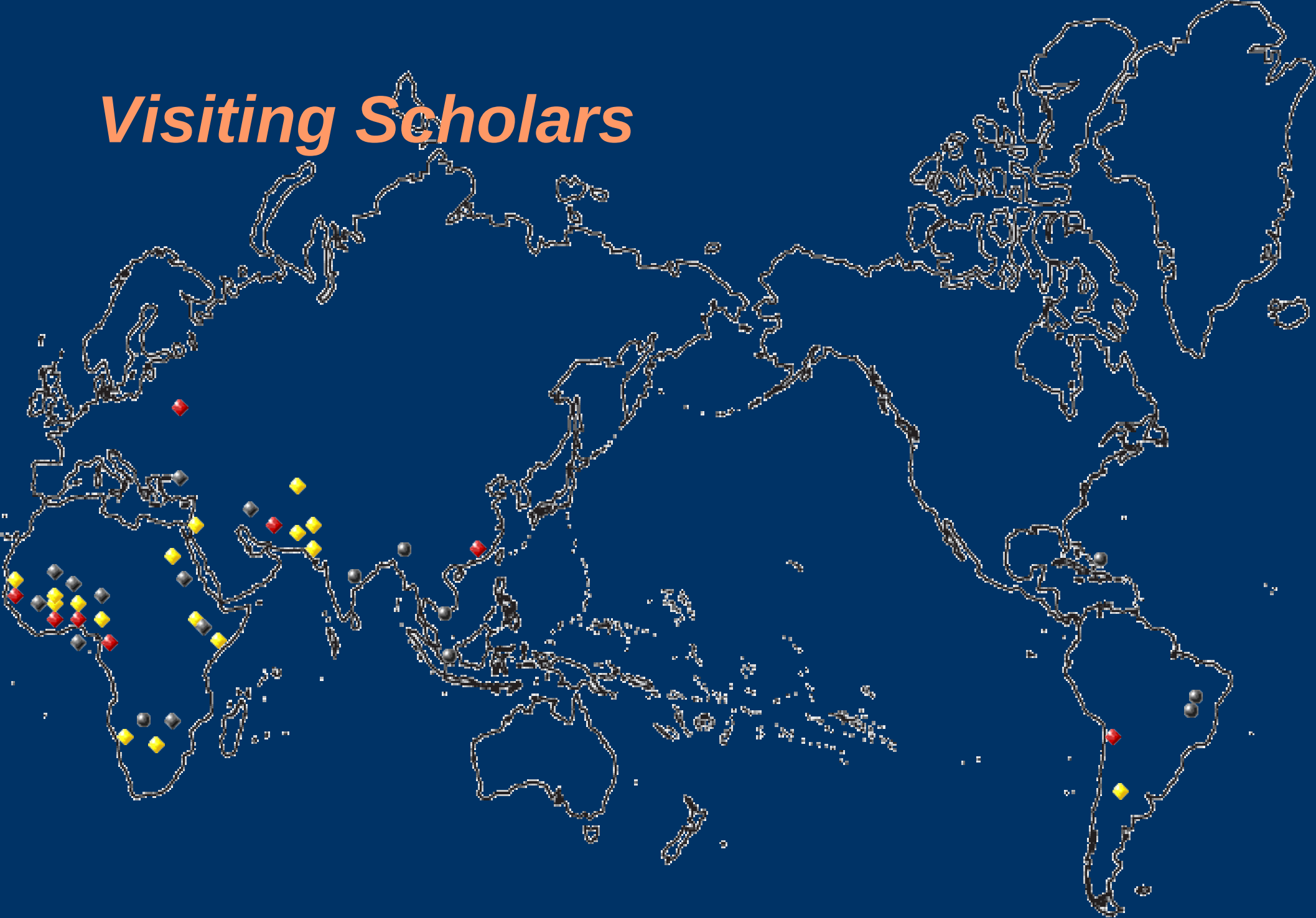
# *Affiliated Centres*



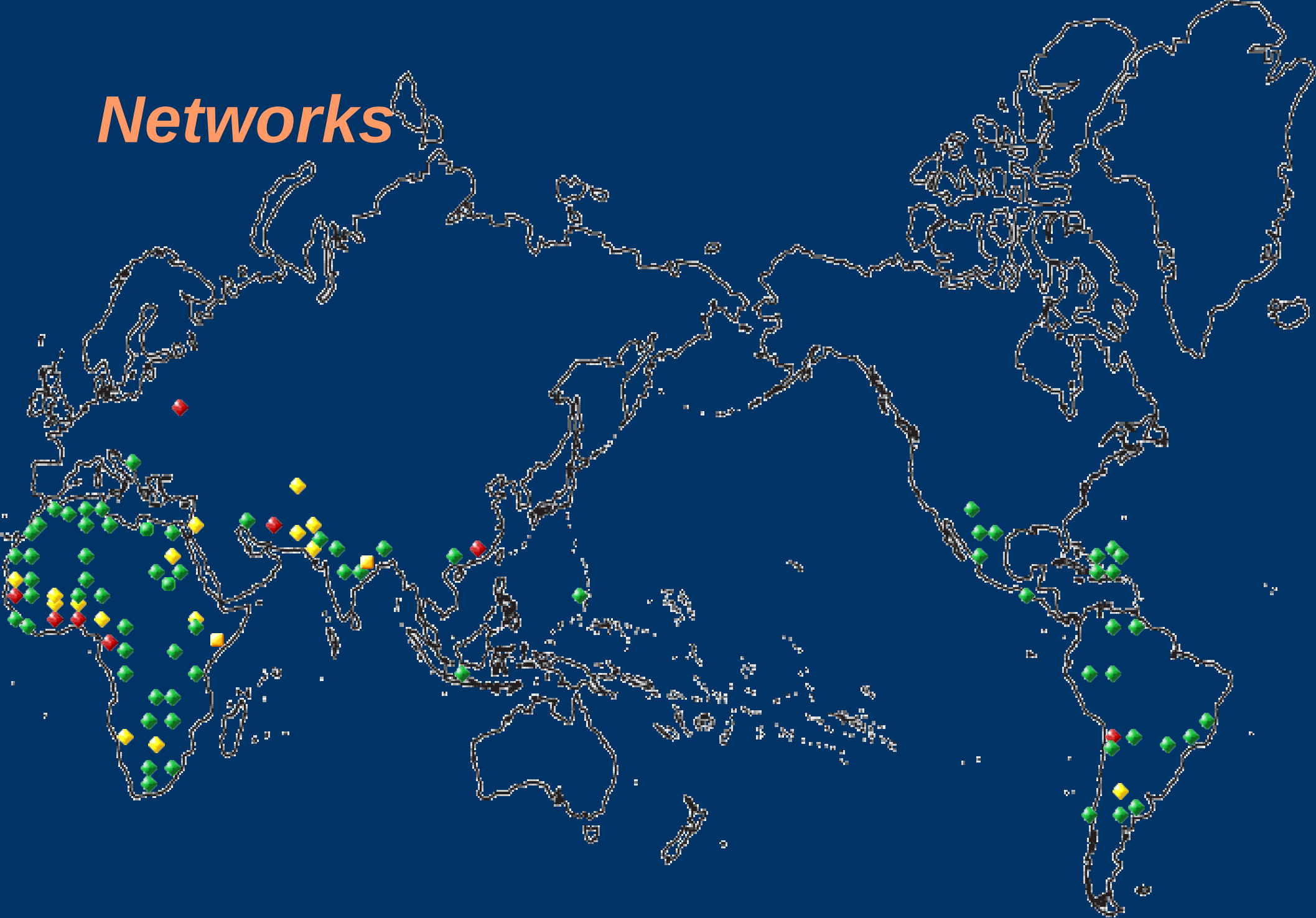
# Projects



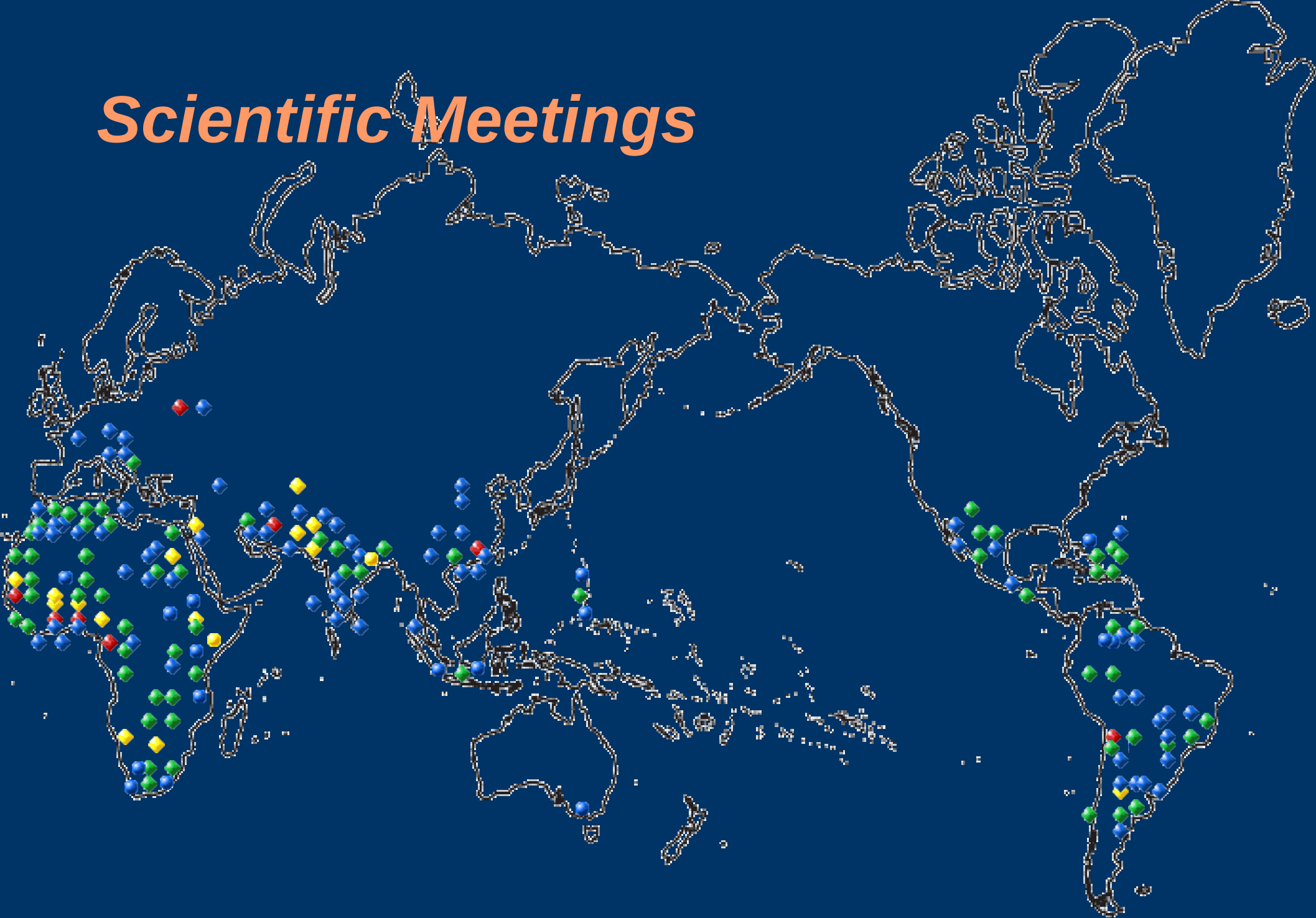
# *Visiting Scholars*



# Networks



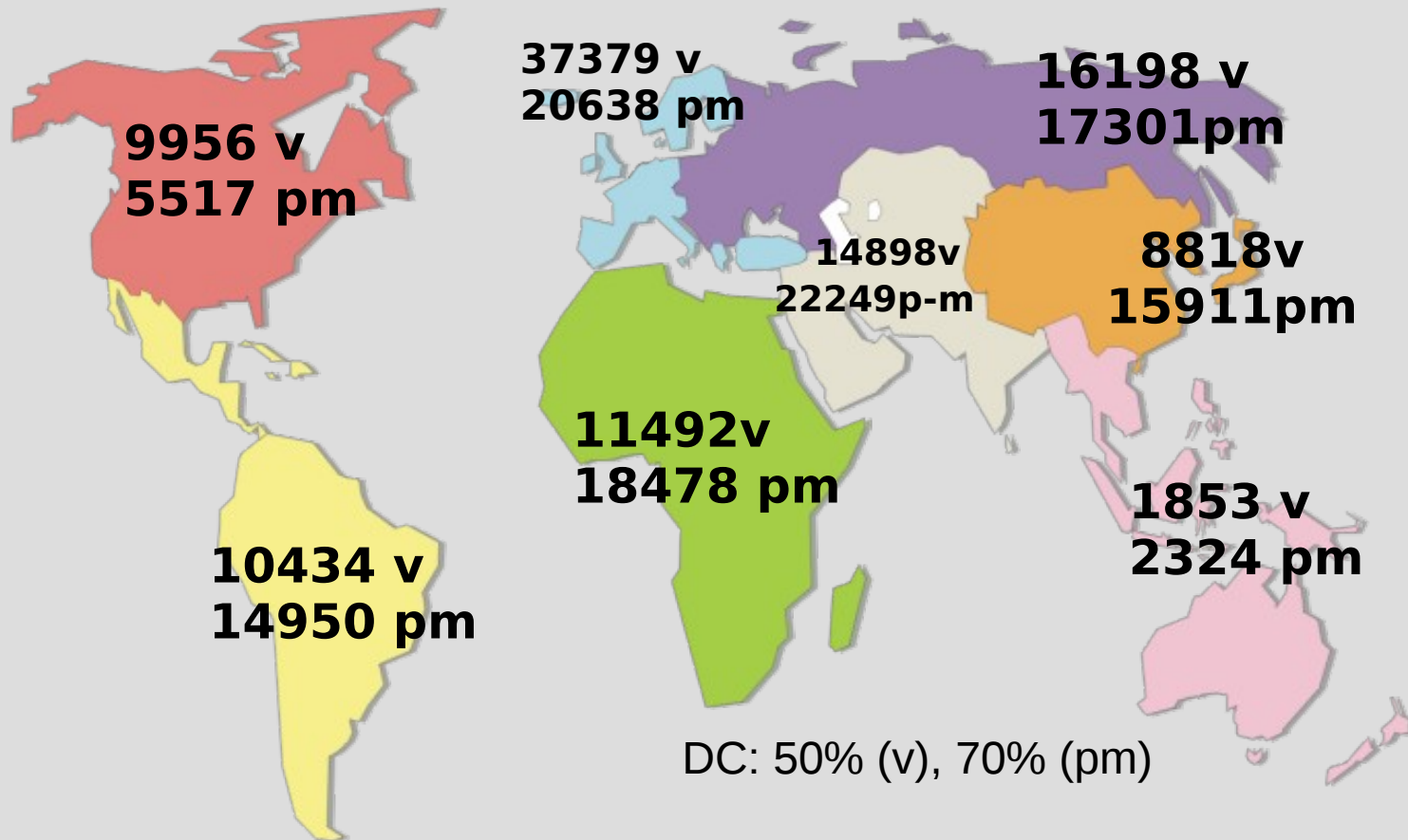
# *Scientific Meetings*



# Research at the ICTP

- Attend ICTP Schools, Meetings and Workshops
- Visit the Research Groups
- Associates of the ICTP
- Federation Agreement

# Visits to the ICTP 1970-2008



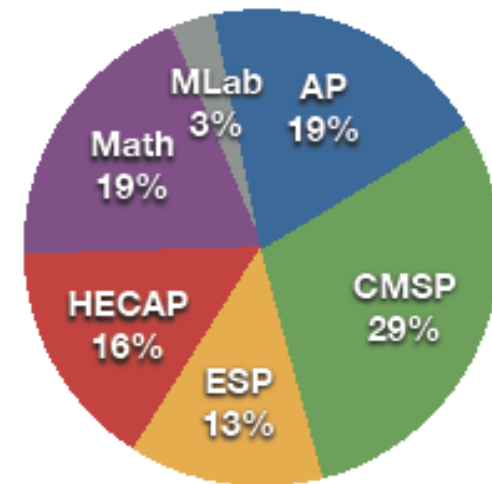
area	visitors	p-m	area	visitors	p-m
North America	9956	5517	Africa	11492	18478
Latin America	10434	14950	Middle East and South Asia	14898	22249
Western Europe	37379	20638	South East Asia and the Pacific	1853	2324
Eastern Europe	16198	17301	Far East	8818	15911

v=visitors p-m=person-months

# Research at the ICTP: Associates Programme

689 Associates from 74 countries

Field of Study	Associate Members by Field of Study
AP	134
CMSP	203
ESP	91
HECAP	107
Math	132
MLab	22
<b>Total</b>	<b>689</b>



AP: Applied Physics  
CMSP: Condensed Matter and Statistical Physics  
ESP: Earth System Physics  
HECAP: High Energy, Cosmology and Astroparticle Physics  
Math: Mathematics  
MLab: Multidisciplinary Laboratory

**In 2008, the programme had a total of 689 appointments and 228 visits. The Associates spent, on the average, 44 days each at the ICTP.**

# How Does The ICTP Do It?

The ICTP is a leading Research Institute with about 25 renowned scientists on staff and a number of scientific consultants

These scientists are actively involved in all of the programmes and thus act as a guarantee of high standards

# Evaluations

- ICTP is a good model offering as it does targeted funding and high international standards for the universities and research institutes it serves (IMU 08/09)
- ...Funds and administrative competence are not enough, however. There is a need to involve the international scientific community in the work ... However, it is necessary to give such involvement of the international scientific community firm and long-term institutional stability. It is in this respect that ICTP has proved unique and outstanding... (Sida 97/98)

**Thank You**

ICTP's scientific programmes and research activities in physics and mathematics provide many opportunities for women to engage in these fields.



Through its efforts, ICTP contributes to the achievement of the Millennium Development Goal 3 to promote gender equality and empower women.

The share of women scientists participating in ICTP activities has grown from 9% in 1985 to 22% in 2007.



## Prize and award winners

**ICTP Dirac Medal**  
2000 Helen Quinn, USA

**ICTP Prize**  
1991 Hong Van Le, Viet Nam  
1998 Anamaria Font, Venezuela

**ICO/ICTP Prize**  
2004 Revati N. Kulkarni, India  
Imrana A. Zahid, Pakistan  
2007 Svetlana V. Boriskina, Ukraine

**Ramanujan Prize**  
2006 Ramdorai Sujatha, India

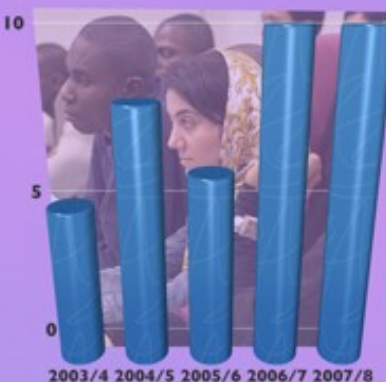


## Women scientists from LDCs

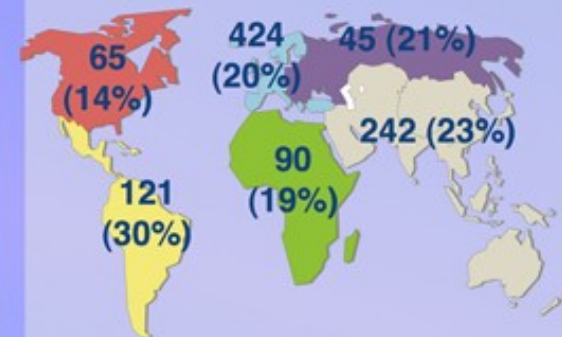
The following Least Developed Countries (LDCs) were represented by women scientists from 2003 to 2007: Bangladesh, Benin, Democratic Republic of the Congo, Ethiopia, Lesotho, Madagascar, Nepal, Senegal, Sudan and Zambia.



## Diploma Programme at a glance: women students



## Geographical distribution of women visitors, 2007



## The rising trend of women scientists at ICTP

(percentage of participation by programme)

Year	Associates	TRIL	STEP	Training	Diploma
2003	14%	21%	29%	19%	14%
2004	16%	23%	19%	20%	31%
2005	16%	25%	29%	19%	21%
2006	17%	24%	34%	20%	29%
2007	18%	28%	38%	22%	20%

TRIL: Training and Research in Italian Laboratories STEP: Sandwich Training Educational Programme  
Training: Schools, Colleges, Workshops and Conferences.

Women visitors (and percentages of the regional total)