Trieste's contributions to world science

K.R. Sreenivasan

The Abdus Salam

International Centre for Theoretical Physics

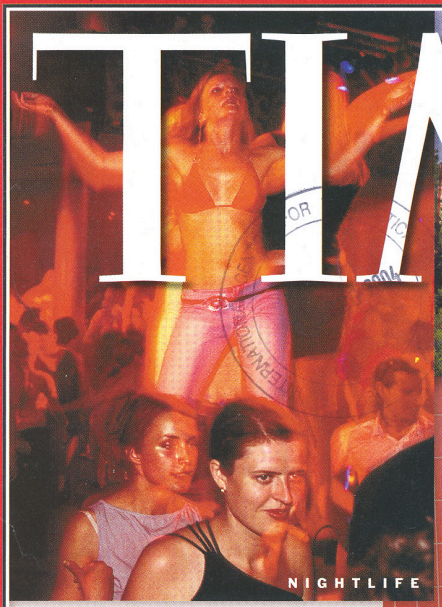
Trieste, Italy

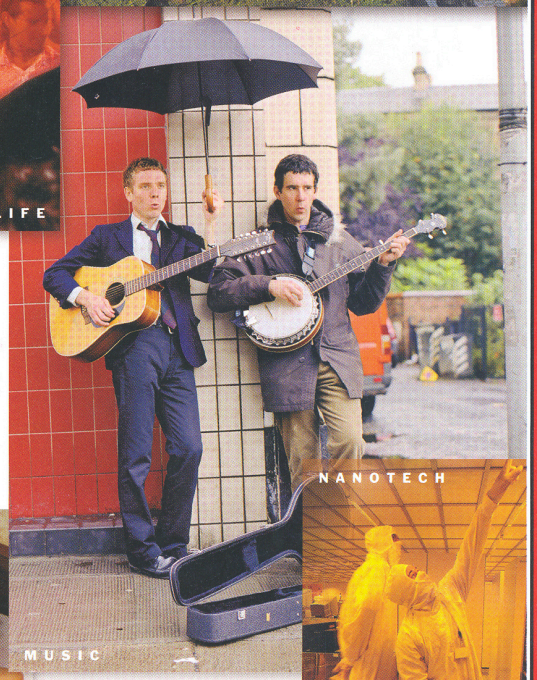
Vienna

October 27, 2004

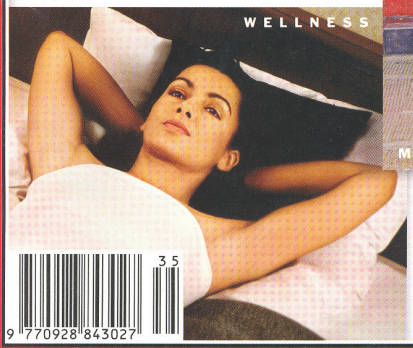
AUGUST 30, 2004 www.timeeurope.com AOL Keyword: TIME

TIME



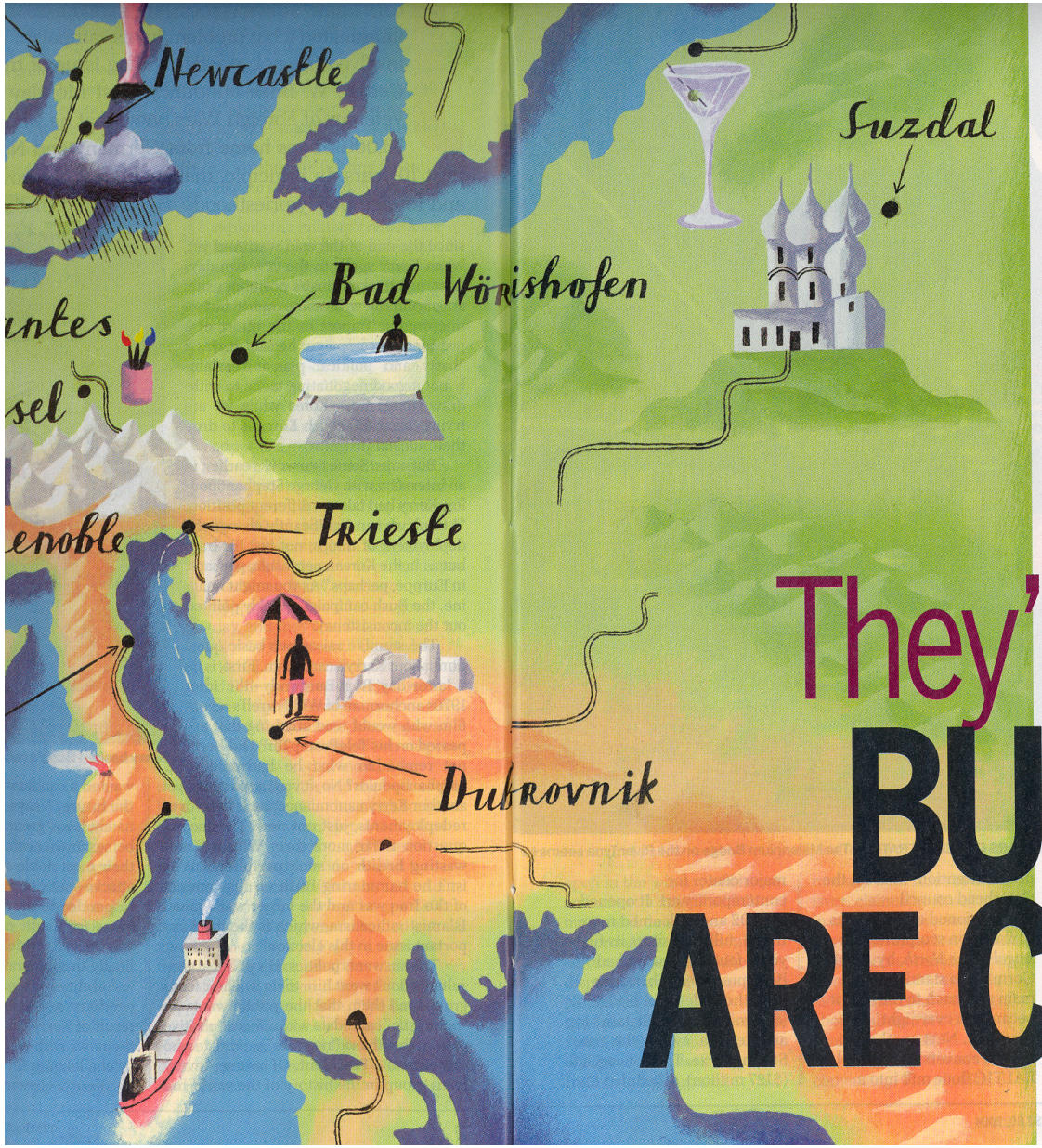


EUROPE'S SECRET CAPITALS



An insider's guide to 14 hot towns, each with a specialty worth boasting about

BELIZE ..... Bze $9.50
BRAZIL ..... R$19.00
CHILE (include tax) $3,500.00
COLOMBIA ..... Col $14,000.00
ECUADOR ..... U.S. $5.00
HONDURAS L85.00
JAMAICA ..... Jam $275.00
MEXICO ..... Mex $55.00
NICARAGUA ..... U.S. $5.00
PANAMA ..... U.S. $5.00
VENEZUELA ..... Bs 10,000.00



our eyes, but invisible all the same, because our gaze is too often distracted by the glare from its brilliant metropolises—London! Paris! Rome! Looking away from the bright lights, TIME's correspondents have discovered 14 secret capitals: not the biggest or best-known places around, but ones that have acquired star status among insiders in a particular field. European cities have always been known for specialties—Sheffield for its cutlery, Chantilly for its lace—but many of these capitals have remade themselves. Industrial Newcastle has swapped coal for high culture; medieval Grenoble has turned itself into a nanotech haven. Other towns—Tallinn, Trieste, Bad Wörishofen—have revved up their ancient rhythms for the new millennium. So think of this special report as a salute to Europe's talent for survival and renaissance. These secrets are worth shouting about.

They're not big, BUT THEY ARE CLEVER

Illustration for TIME by Russell Cobb

ALBERTO BEVILACQUA—GRAZIA NERI

WATER WAY: A rise in traffic at Porto Faro, Trieste's main port, is one sign that the city is regaining its place as a trade hub

TRIESTE {gateway to the new europe}

Eastward Bound and TRADING UP

There's something in the air over this bustling trade city on Italy's Adriatic coast: the aroma of sea, espresso—and economic opportunity

By JEFF ISRAELY

FROM MOST ANGLES, Trieste's expansive Piazza dell'Unità d'Italia is similar to other landmark squares in Italy: Baroque facades, leisurely cafégoers and ubiquitous flocks of pigeons. But turn your back to City Hall and Piazza dell'Unità opens directly onto the Adriatic Sea—it's the only major Italian square that sits on a coastline. The tangy sea vapors that permeate the place are a constant reminder of Trieste's past as a bustling port in the Habsburg empire of the 18th and 19th centuries. Happily, there's also a taste of its future in the air.

Bordering Slovenia—and less than 450 km from Milan, Munich, Vienna, Zurich and Budapest—this northeast sliver of a city (pop. 220,000) is the gateway to a Europe expanding eastward. Already, port traffic has jumped from 3.3 million tons in 1998 to 5.4 million tons in 2002. That's not a big hill of beans in the global scheme of things—major international ports handle 15 times Trieste's tonnage—but it's pretty good for a boutique port catering to New Europe. "This is a moment of great hope," says Enrico Samer, managing director of Samer & Co., a shipping brokerage and insurance company founded here in 1919.

With the rise of the Iron Curtain after World War II, trade through Trieste dried up. Now, with E.U. enlargement and the promise of an explosion of consumer trade with China, Samer anticipates a dramatic new growth curve. "Trieste is the natural port that opens to the center of Europe," he says. But the city can only realize its potential if it makes good on long-overdue plans to expand its rail and highway connections.

Espresso baron Riccardo Illy, who has helped expand his Trieste family's coffee empire into 70 countries, is the most recognizable public official in the city, having served eight years as mayor and one as regional president for Friuli-Venezia Giulia. As a port city and border town, he says, Trieste is "all about diversity." There is a part of the city's identity that is certainly Italian, but a part is also "very much Mitteleuropa," says Illy. His own family illustrates the point: Illy's Hungarian grandfather founded the coffee company in 1933. "Now Trieste is ready to recover its natural hinterland. We are ready to bloom."

As one of three finalists (with Zaragoza and Thessaloniki) for the international Expo 2008, a world's fair of science, culture and technology, Trieste is vying to play on a bigger stage. If it gets the nod in December, there will be a surge of investment in the Old Port area. (Trieste has also become a capital of scientific research, with the growing stature of the International Center for Theoretical Physics and the International Center for Genetic Engineering and Biotechnology.) Roberto Drozina, a top manager of Trieste's industrial consortium, says the city must prove it can grow on its own, without state aid. "If Trieste were a stock, I'd buy some shares, maybe not a lot," he says. "But I think in four or five years, you'll start to see a real return." ■

MR. BEAN: Illy has helped expand the family coffee empire into 70 countries

Extracts from the article

Trieste has also become a capital of scientific research, with the growing stature of the International Centre for Theoretical Physics and the International Centre for Genetic Engineering and Biotechnology…Roberto Drozina, a top manager of Trieste's industrial consortium, says…"If Trieste were a stock, I'd buy some shares…I think in four or five years, you'll start to see a real return."

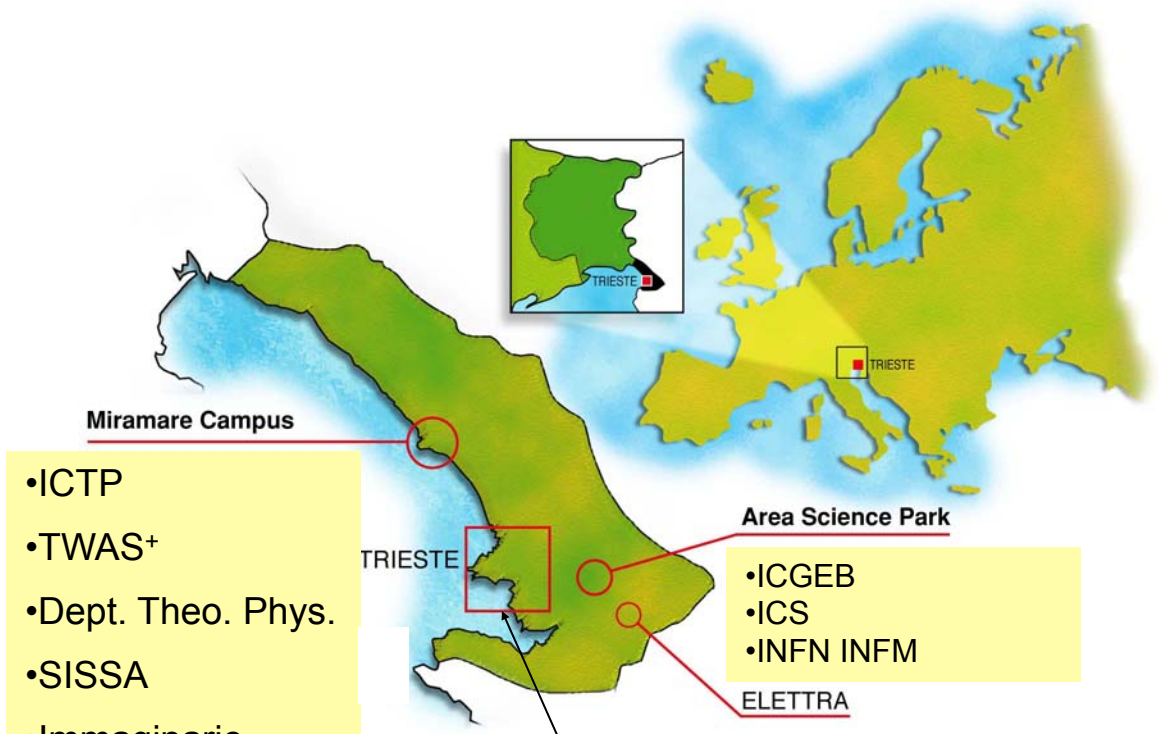
Scientist population in Trieste

	USA	Giappone	UE	Italia	Regione FVG	Trieste
Ricercatori, tecnici e addetti ai servizi*	14	12,9	9,5	6,2	14,1	49,3
Ricercatori*	8,1	9,3	5,3	3,3	10,1	35,6

* per 1000 unità di forza lavoro

Courtesy of Professor Maria Cristina Pedicchio

Scientific Institutions in Trieste



A few words about ICTP

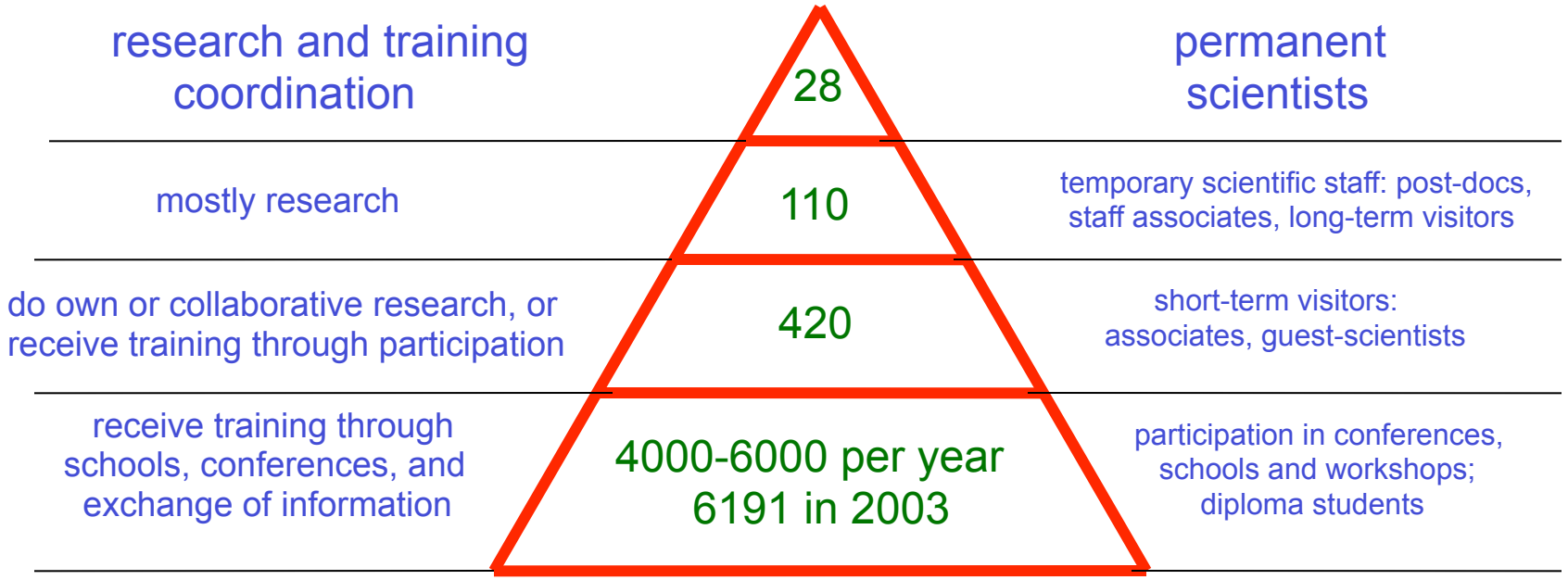
(International Centre for Theoretical Physics)

- Founded* in 1964, ICTP operates under a tripartite agreement between two United Nations Agencies—UNESCO and IAEA—and the Government of Italy.
- ICTP's mission is **to foster the growth of advanced studies and research in developing countries**.
- Some base funding is provided by UNESCO and IAEA, some programmatic funding by SIDA, the Kuweit Foundation and others, but the largest (~80%) of the Center's budget comes from Italy.
- ICTP's working principle is **that creating scientific knowledge is important and sharing it with others is at least as important.**
- ICTP is an institution run by a few scientists for the benefit of many.

---

*by Abdus Salam, 1979 Nobel Laureate in Physics. The Centre now bears his name.

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



ICTP Scientists, Visitors and their Functions

+ about 125 general staff

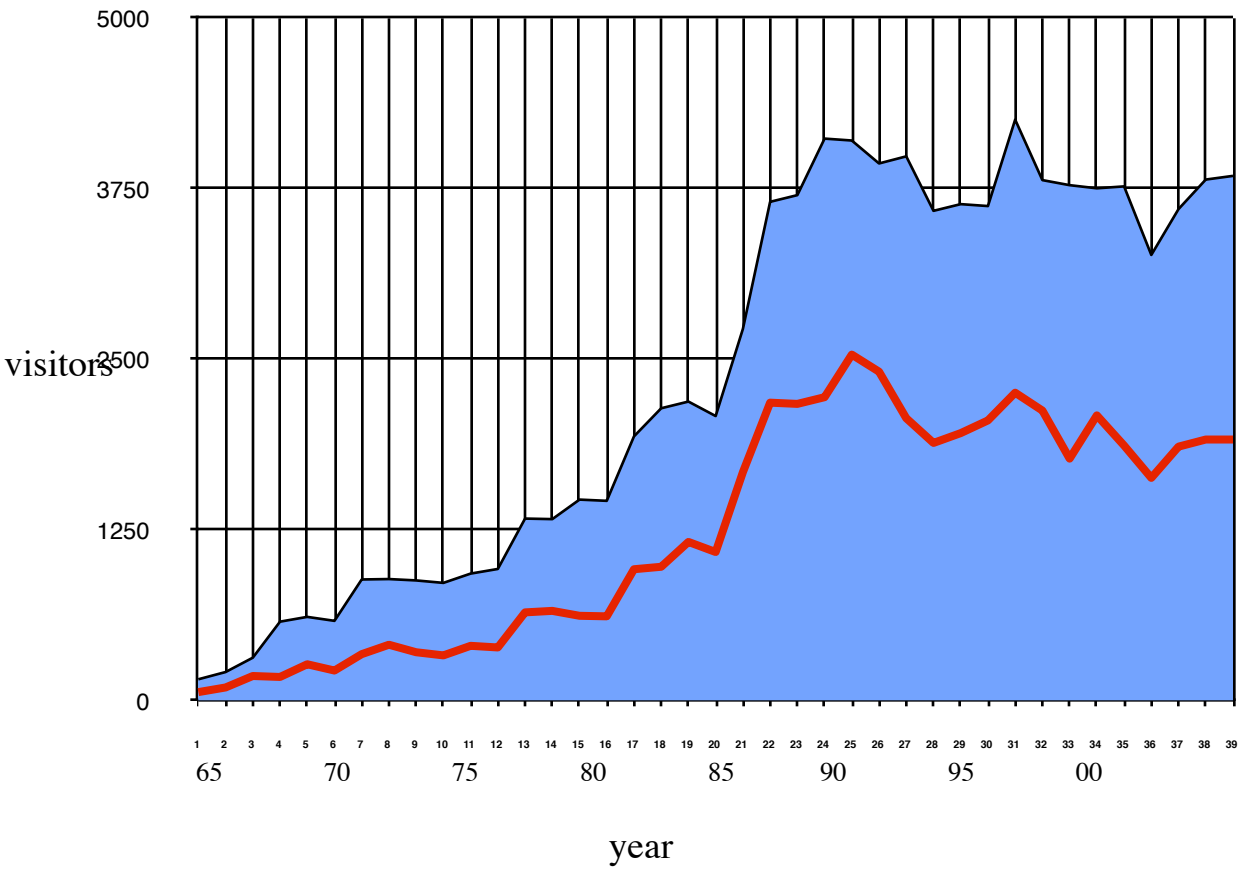
Research at ICTP

Carried out by 28 permanent scientists, about 50 post-docs, short-term and long-term visitors, consultants and collaborators from other Trieste institutions, in areas such as:

- High Energy, Cosmology and Astroparticle Physics
- Condensed Matter and Statistical Physics
- Pure and Applied Mathematics
- Applied Physics (Medical Physics, Optics and Lasers, Fluid Dynamics, Plasma Physics, Soft Matter and Biophysics, Nuclear Physics, Information Science and Technology, …)
- Earth Sciences (Weather, Climate Changes, Oceanography, Earthquake Prediction, Soil and Coastal Erosion, Desertification,…)
- Ecological and Environmental Economics

IT IS IMPORTANT TO HAVE A STRONG CORE OF SCIENTIFIC EXCELLENCE: WHAT WE DON'T HAVE, WE CANNOT IMPART TO OTHERS.

ICTP visitors: 1964-2003



upper line:
total visitors

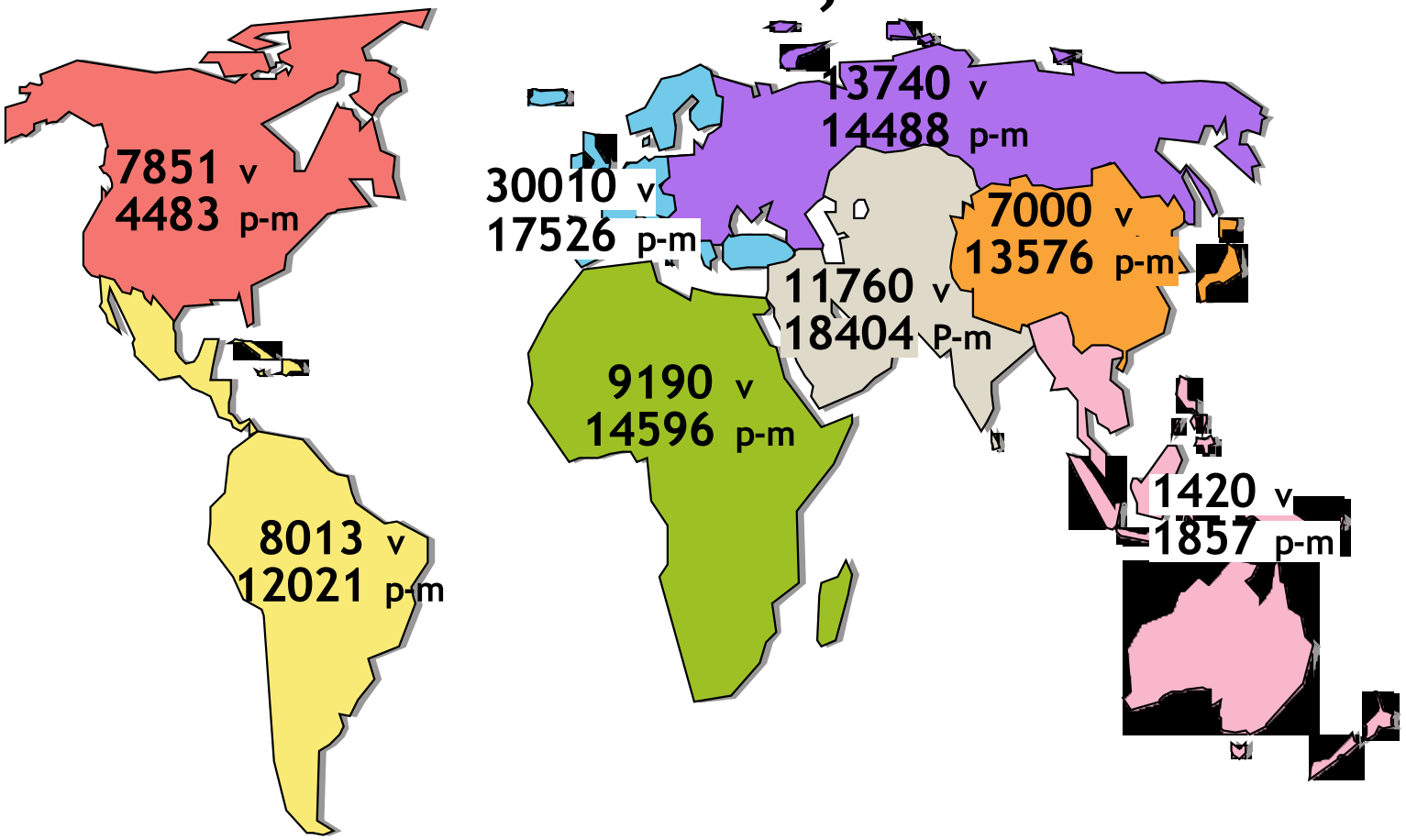
lower line:
from
developing
countries

note:

number of visits is about 20% higher;

number of visitors with some form of self-support bring up the total by another 20% (6191 in 2003)

ICTP visitors statistics, 1970-2003



area	visitors	p-m
North America	7851	4483
Latin America	8013	12021
Western America	30010	17526
Eastern Europe	13740	14488

area	visitors	p-m
Africa	9190	14596
Middle East and South Asia	11760	18404
South East Asia and the Pacific	1420	1857
Far East	7000	13576

v=visitors p-m=person-months

ICTP's impact on the world of science

ICTP has had a longstanding impact on the science in Iran… the most important one is the concept of excellence…and I dare say ICTP has been the most influential institution in the world to bring that into existence. [It also has had] direct impact [on the] establishment of the various institutions; many graduate students in Iran have been exposed to international scientific community through different activities of ICTP.

Professor Reza Mansouri
Deputy Minister for Research, Iran

ICTP was very useful to me personally …[and] it opened up a new world to me. Almost all of my colleagues at the Centre for Theoretical Physics in Hanoi get the same help from the ICTP. In addition, we also get book donations, computers, etc. For young physicists, the ICTP Diploma program is very attractive.

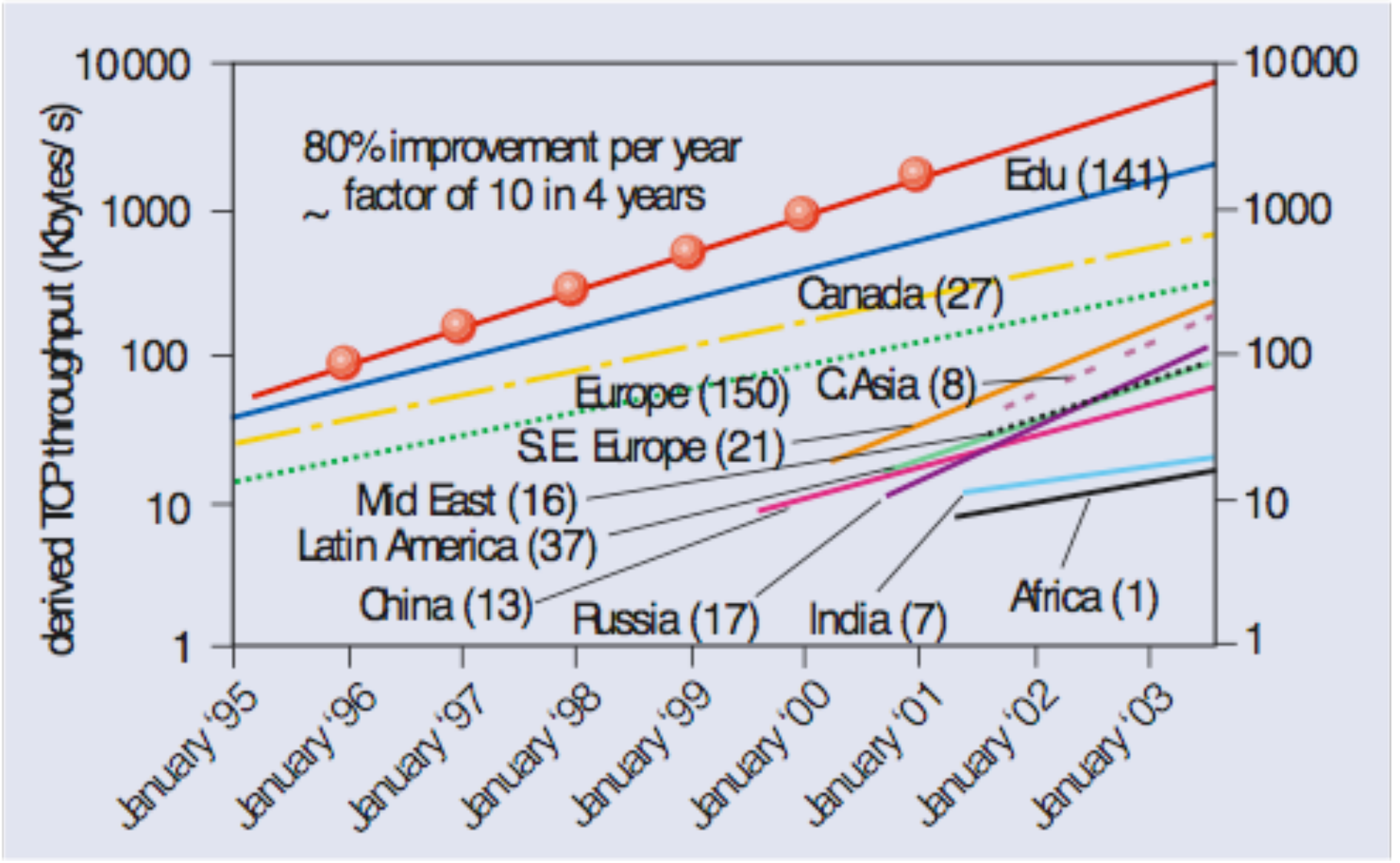
Professor Hoang Ngoc Long
Head of Particle Physics division, Vietnam

One particular international institution that has played an important role in providing resources and opportunities for physicists [in Africa] is the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy. …ICTP provides resources and opportunities so that physicists in Africa may attend classes, perform research, or work on publications at the center for short periods. ICTP's affiliated centers and visiting scholars programs are well known in African universities; nearly every PhD physicist in East Africa has had an association with the ICTP.

Professor Edmund Zingu
Physics Today, January 2004

Italian leadership in computational condensed matter physics …would not have happened without ICTP.

Professor Erio Tosatti
SISSA, Trieste


derived TCP throughput (Kbytes/s)
10000
1000
100
10
1
80% improvement per year
~ factor of 10 in 4 years
Edu (141)
Canada (27)
Europe (150)
C.Asia (8)
S.E. Europe (21)
Mid East (16)
Latin America (37)
China (13)
Russia (17)
India (7)
Africa (1)
January '95
January '96
January '97
January '98
January '99
January '00
January '01
January '02
January '03

BIT MAP

A World Divided By A Common Internet

We hear a lot about the digital divide—the gulf between rich and poor—but it's a hard thing to quantify, especially when it comes to the Internet. In a breakthrough study of all 178 nations in the world, released last November, the International Telecommunication Union came up with a set of metrics that finally shows who's bit-rich and who's bit-poor, and why.

The ITU calculated a ranking for each country, which it called the Digital Access Index (DAI), determined by such factors as education, the affordability of Internet access, and the proportion of Internet users with high-speed connections, in addition to the raw availability of bandwidth. On the map, the DAI is represented by height: the taller the bar, the better the nation's Internet access.

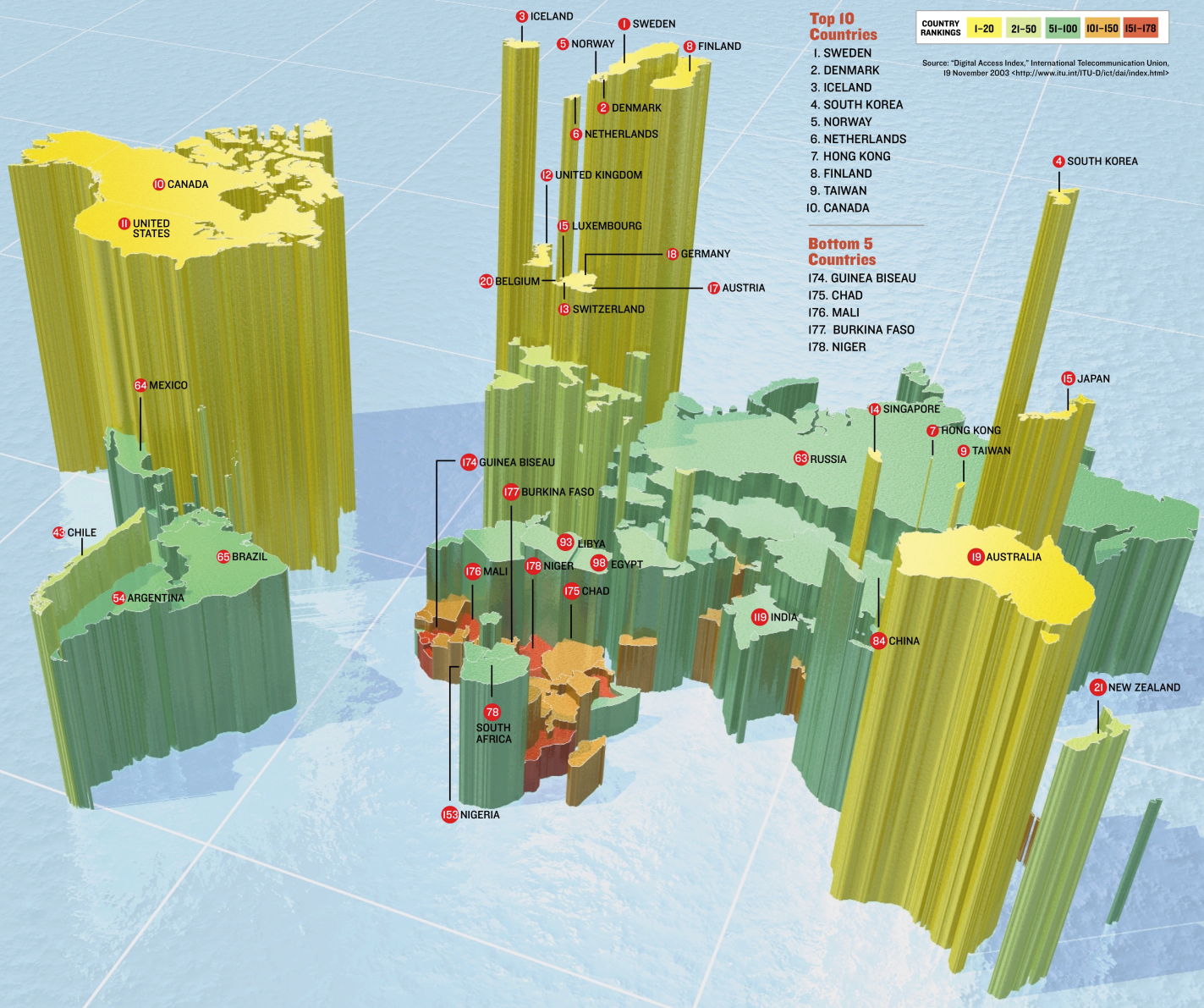
Four of the five top-ranked countries are in Scandinavia, with Sweden coming out on top. The first non-Scandinavian country is South Korea (4). The United States ranked 11, one notch below Canada. Japan was 15. Surprisingly, Slovenia tied with France, Italy, and New Zealand at 21.

In fact, smaller nations often ranked higher than their larger counterparts: Hong Kong (7), Singapore (14), Luxembourg (15, tie), and even the Seychelles (52) doing better than Russia (63), China (84), and India (119).

The United States may have been penalized by one of the factors used to determine rankings—a quality measurement that considered the total bandwidth connecting a country to other countries, divided by the number of inhabitants.

Because so much of the Internet still physically resides in the United States, there's far less need for international connections than in, say, Denmark (2). However, as time goes by and more and more of the Internet exists outside the United States, Americans may find themselves truly slipping behind if they do not invest in more global connectivity.

Perhaps the most interesting factor was affordability, defined by what it costs to access the Internet as a percentage of a country's gross national income per capita. The measure considered the basic monthly cost of Internet access for an individual line plus any additional cost for 20 hours online (10 peak hours



Top 10 Countries

1. SWEDEN
2. DENMARK
3. ICELAND
4. SOUTH KOREA
5. NORWAY
6. NETHERLANDS
7. HONG KONG
8. FINLAND
9. TAIWAN
10. CANADA

Bottom 5 Countries

174. GUINEA BISEAU
175. CHAD
176. MALI
177. BURKINA FASO
178. NIGER

COUNTRY RANKINGS: 1–20 | 21–50 | 51–100 | 101–150 | 151–178

Source: "Digital Access Index," International Telecommunication Union, 19 November 2003 <http://www.itu.int/ITU-D/ict/dai/index.html>

Summary

ICTP works for quality science in developing countries mostly through the best scientists it can identify

Quality and diversity are NOT incompatible

The ICTP visitors are seeds for further growth in their own countries

The Centre is the living example of the mobility of knowledge: the investment in people is the best of its kind.

As it happens, MOBILITY OF KNOWLEDGE is the theme of EXPO2008 proposed by Trieste.

Trieste as a candidates for EXPO2008

Trieste has made an excellent case through

National, Regional, Local Governments
Business and Political Institutions in Trieste
Various Ambassadorial Outposts of Italy
Scientific Institutions in Trieste

Why scientific institutions?
Because of the long experience of the Trieste Institutions in relation to the theme

Final decision in December by the BIE delegates

We hope that Trieste will be chosen
(which will enhance the city's strong support for science in developing countries)

- ICTP celebrated its 40th anniversary earlier this month. We were very pleased to have had an enormous moral support from the Italian Government and local authorities. I made a few opening remarks, which I now wish to repeat.
- This Centre was created to mitigate scientific imbalance in the world and overcome the isolation of scientists who work in developing countries. Its broad goals are still the same.
- Today, the Centre runs under the international umbrella of UNESCO and IAEA and the major financial support of the Italian government, for which I am very thankful.
- To be a source of strength, the Centre itself has to do world-class science. The areas covered by the Centre today range from such basic subjects as String Theory to others such as Climate Change and its Economic Impact. ICTP's unchanging message is that scientific accomplishments require commitment to personal excellence that transcends excellence in infrastructure or living conditions---although they are both much needed.
- For forty years the Centre has valiantly discharged its functions.
- Yet, forty years on, we still live in a world in which the majority of all scientists, scientific discoveries, patents and publications come from a small number of developed countries. The thirst for knowledge remains even as others have deteriorated.
- So, what exactly has our Centre accomplished?
- First, ICTP's own staff, post-docs, visitors and scientific consultants, who form its scientific, have many scientific accomplishments behind them. I will not list them here but merely note the world-class status of the Centre as a research organization.
- Second, the Centre has been involved, to various degrees, with the careers of some 100,000 visiting scientists. They have come from nearly every country in the world, about half of them from developing countries. As one example, I quote from a Physics Today article of Edmund Zingu of South Africa: "Nearly every Ph.D. in Africa has had some connection with ICTP." ICTP is a living proof that scientific excellence is compatible with diversity: we care most of all for the quality of the individual.
- I believe that this investment in human capital is the best that anybody ever made.
- A third point, perhaps an extension of the second, is that scientific progress in the last 40 years is, in fact, encouraging in several countries, where world-class science communities have indeed sprung up. More countries are on this same path. I am pleased that, in some measure, ICTP has been involved in this endeavor.
- These are quantifiable measures, and we are proud of our accomplishments. But I don't want to dwell more on the past, and instead ask:
- What does the future hold?
- The present world is different from that of forty years ago. The Centre's functions were then seen in the light of a moral imperative. Today, they are at least as much a practical necessity. The world has come to realize that no country can prosper in isolation, and that no country can be left too far behind. The consequences of such neglect could be very costly for all. The building of scientific capacity everywhere is thus in our collective self-interest, and the Centre's role is thus even more important.
- Many of ICTP's programs are the result of long experience, and we will continue to follow most of them. But we must do some things differently. I indicate here only three items.
- First, the uneven scientific progress made in the South is, in fact, a great opportunity for deep exchange between the South's scientifically more proficient and less proficient countries. ICTP will make stronger efforts to partner with like-minded but world-class institutions which can act as hubs of scientific excellence in their regions. The goal of our partner institutions should be the creation of local scientific capacity---not merely transfer of technology.
- Second, while ICTP will not diminish its commitment to individual scientists, we will become increasingly involved in institutional changes and infrastructural improvements. Lasting change can take place only if institutions and nations – not just individual scientists – embrace science as a critical tool for growth.
- Third, there are several countries---for example in the South-East Europe and Central Asia---where scientific traditions and talent are abundant but are getting weaker by the day because of lack of infrastructure. We intend to engage them more.
- The year 2005 is the world year of Physics; it offers us more opportunities for synergetic interactions with the Italian and the world Physics community.
- I wish to end with a lofty quote from a speech that Mr. Andreotti gave exactly twenty years ago at the Centre. He was then the Minister of Foreign Affairs in Italy.
- "Questo Centro possa offrire un contributo efficace alla soluzione del problema centrale dell'umanita, che e quello della pace."
- Loosely translated, this means: "This Center can make an effective contribution to the solution of the central problem of humanity, namely that of peace."

Latest Agreement between Sida and ICTP for the years 2003 to 2005.
Yearly budget ≅ Euro 760,000

Purpose: To engage scientists in sub-Saharan Africa

ICTP Office of External Activities receives about 50%
Affiliated Centres *Euro 83,394*
Projects *Euro 83,300*
Networks Programme *Euro 44,000*
Visiting Scholars/Consultants *Euro 18,790*
Scientific Meetings *Euro 91,500*
Miscellaneous Expenses *EURO 4,000*

Associates Office receives xx%
Distribution

ICTP spends additional money on Africa from its core funding.

International Institutions in Trieste