

The Importance OF Centers OF Excellence Worldwide

DAVID GROSS

Kavli Institute
for
Theoretical
Physics



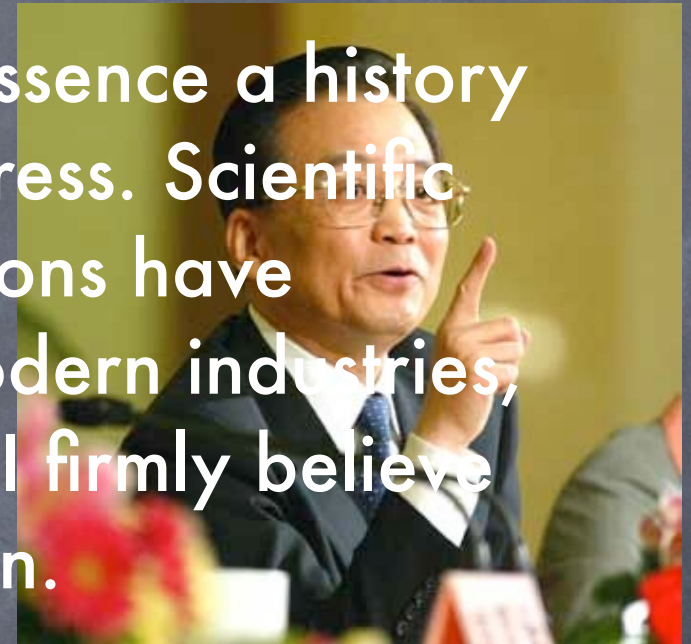
ICTP AT 50

October 6 , 2014

The Importance of SCIENCE

- The history of modernization is in essence a history of scientific and technological progress. Scientific discovery and technological inventions have brought about new civilizations, modern industries, and the rise and fall of nations . . . I firmly believe that science is the ultimate revolution.

Premier Wen Jiabao



- Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been.

President Barack Obama



Technology Driven Science

The justification for investigating questions whose answers have ready applications for society is obvious.

Why Curiosity Driven Science ?

- ★ To Satisfy Our Curiosity

We have evolved to **understand**
and control the world around us.

The search for understanding of
the world around us and its
origins are at the core of what it
is to be human.

Why Curiosity Driven Science ?

★ To Satisfy Our Curiosity

★ To Motivate Excellence

Many of the most intelligent, inquisitive and innovative people are attracted to basic science, to the attempt to understand the BIG questions.

Basic research benefits all of society by educating and training thousands of students who will choose to enter the workforce not only in academic research but as workers in many diverse industries.

Why Curiosity Driven Science ?

★ To Satisfy Our Curiosity

★ To Motivate Excellence

★ To Produce Truly
Novel Technology

The Importance of BASIC SCIENCE

- . . . although basic science can have colossal economic rewards, they are totally unpredictable. And therefore the rewards cannot be judged by immediate results. The greatest economic benefits of scientific research have always resulted from advances in fundamental knowledge rather than the search for specific applications. . . . transistor was not discovered by the entertainment industry, working on wave mechanics and solid state physics. Nuclear energy was not discovered by oil companies with large budgets seeking alternative forms of energy. It was discovered by scientists like Einstein and Rutherford. . . ."

Margaret Thatcher



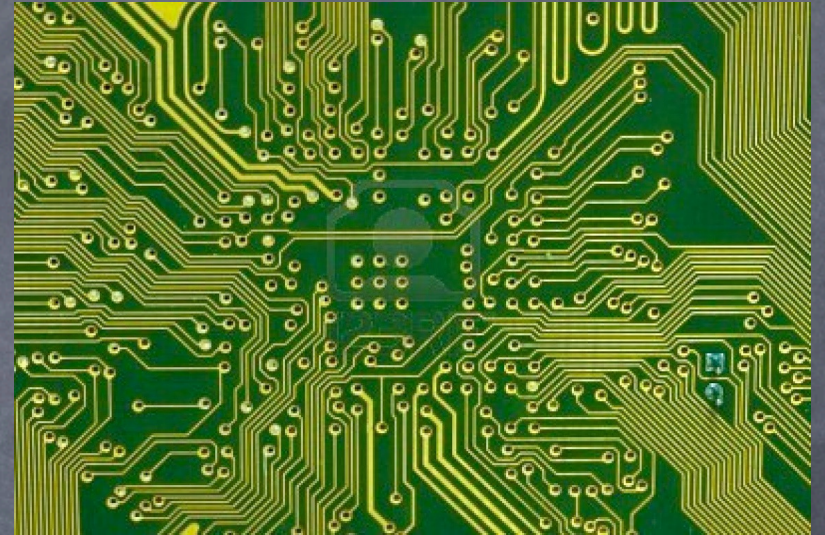
NATURE IS SMARTER
THAN WE IN POSING
GOOD QUESTIONS
FOR RESEARCH

QUANTUM MECHANICS

1901--1926



TRANSISTOR



INTEGRATED CIRCUIT



LASER



THE BEST
IS YET
TO COME

Niels Bohr Institute

1921



Institute for
Advanced Study
Princeton, 1930



The Abdus Salam
International Centre for Theoretical Physics

1964



Paolo
Budinich



ICTP International

Why Basic Science?

Why not Technology?

It is just impossible to talk
only of technology transfer.

One should talk of science
transfer first and technology
transfer later...

Unless you are very good at
science you will
never be good at technology.

Scientific thought is the
common heritage
of mankind.

Let us strive to provide
equal opportunities to
all so that they can
engage in the creation
of Physics and Science
for the benefit of all
mankind.

THE ICTP MISSION

Foster the growth of advanced studies and research in support of excellence in developing countries.

Develop high-level scientific programs and provide an international forum of scientific contact for scientists from all countries.

Conduct research at the highest international standards and maintain a conducive environment for scientific enquiry for the entire ICTP community.

I
C
Theoretical
Physics

Theorists, unlike their public image,
are not loners.

They are intellectual extroverts, even if
they are often social introverts.

**They crave engagement with other
theorists; they collaborate in joint
projects with groups of one, two
or more colleagues.**

They share their ideas freely, exposing their ideas to constructive suggestions as well as to criticism.

Theoretical physics is an intensely cooperative effort.

Face-to-face interaction is irreplaceable.

Theory institutes therefore play an important role in advancing the theoretical sciences.

The division of science into different disciplines---
physics, chemistry, biology, geology, ...
is rather artificial.

Today some of the most exciting developments are
taking place at the boundaries of these traditional
fields and require the efforts of many different
kinds of scientists.

**Theory serves as glue for
interdisciplinary efforts.**

Imitation is the
sincerest form of flattery

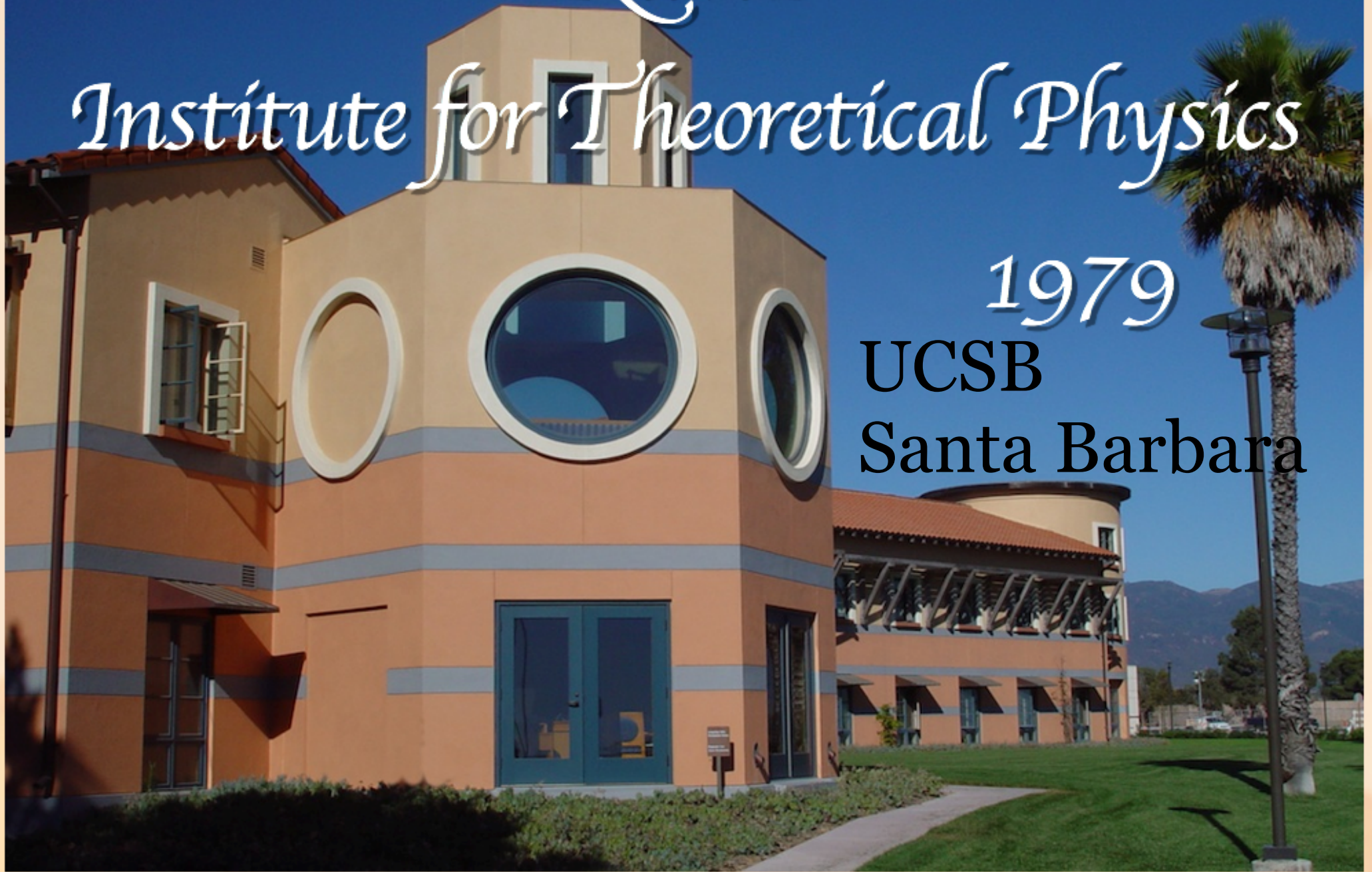
Kayli

Institute for Theoretical Physics

1979

UCSB

Santa Barbara



Mathematics Institutes



AIM, IMA, IPAM, SAMSI, MBI



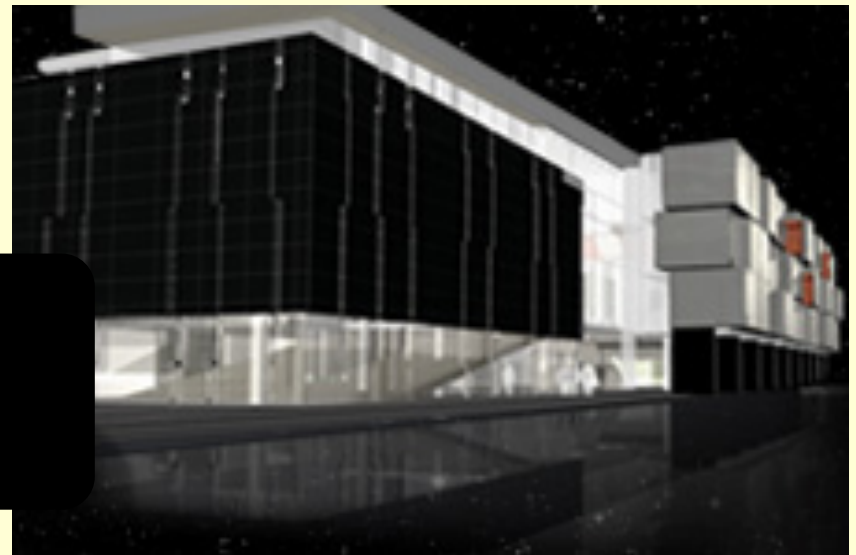
The Newton Institute, Cambridge, England



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Seattle, Washington



PERIMETER **PI** INSTITUTE FOR THEORETICAL PHYSICS



Max Planck Institute for the Physics of Complex Systems



KITPC

Kavli Institute for Theoretical
Physics China
at the Chinese Academy of
Sciences







AIMS
SOUTH AFRICA

What Does It Take To Succeed?

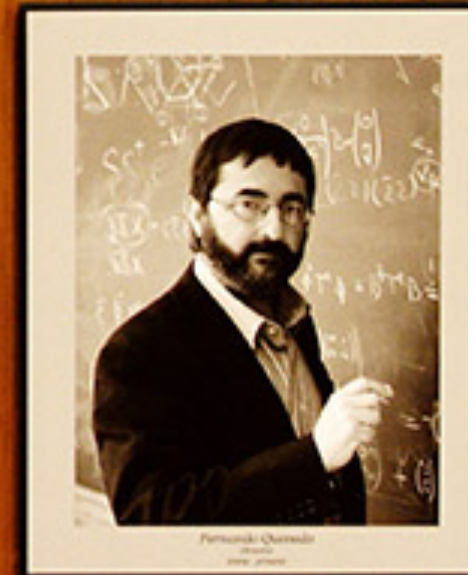
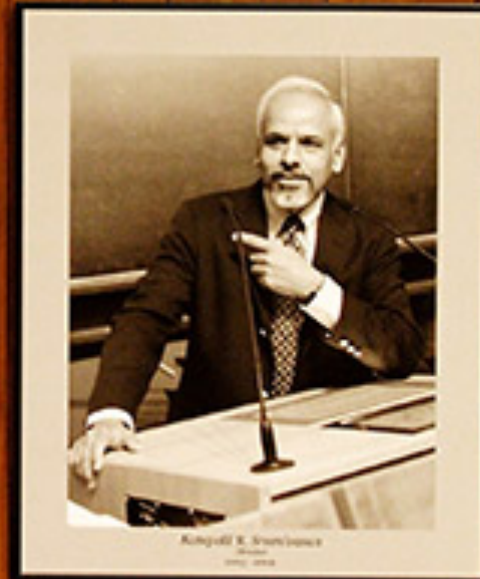
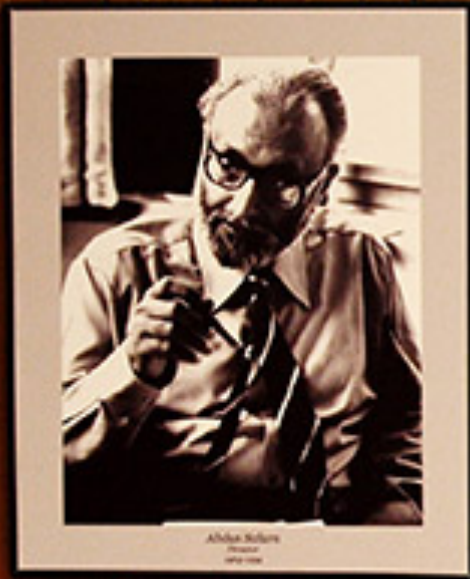
Excellence

Excellence

Excellence

Vision

Leadership



SUPPORT

Italy, Unesco, IAEA

ICTP BRANCH INSTITUTES AROUND THE WORLD

Brazil
Mexico
Turkey
Rwanda
China +....

AFTER 50 YEARS ICTP IS A GREAT SUCCESS

Salam would be proud

ICTP can be proud

Italy should be proud

Unesco should be proud

IAEA should be proud

I MIGLIORI AUGURI

THANKS

THE END