The Abdus Salam
International Centre
for Theoretical Physics

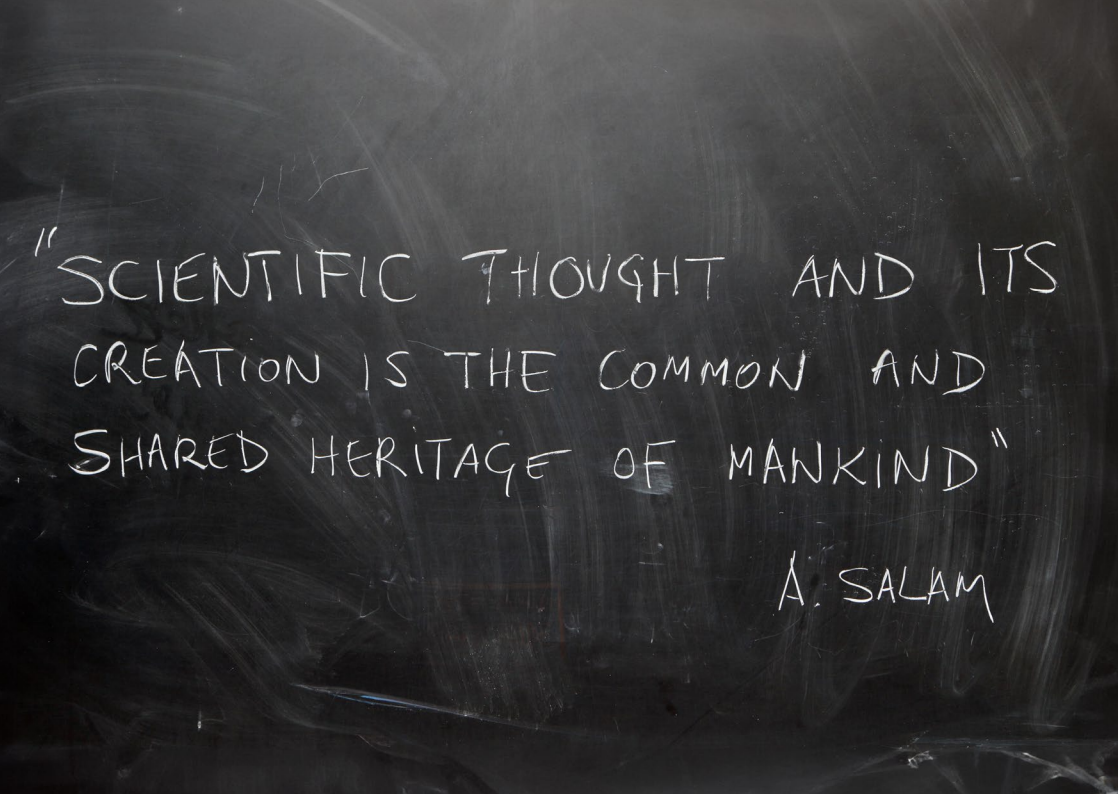
IAEA
International Atomic Energy Agency

unesco
United Nations
Educational, Scientific
and Cultural Organization

ICTP:
Science without borders

Mission and History

The Abdus Salam International Centre for Theoretical Physics (ICTP) is a unique institution that explores fundamental scientific questions at the highest level, promotes active engagement with scientists in developing countries, and advances international cooperation through science.

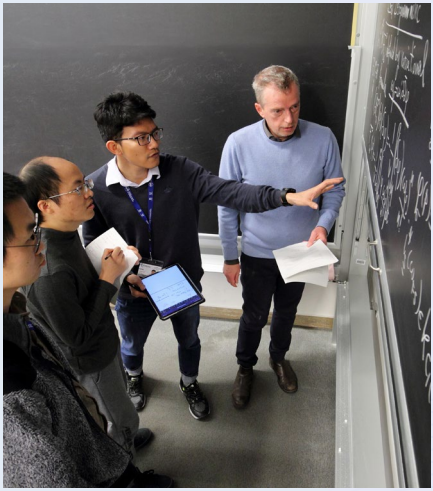


ICTP was founded in 1964 in Trieste, Italy, by Pakistani Nobel Laureate Abdus Salam, out of his conviction that science is the common heritage of humankind. By securing strategic support from the Italian government, the International Atomic Energy Agency (IAEA) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), Salam laid the foundations for what was to become ICTP's extraordinary environment for advancing knowledge in the physical and mathematical sciences.

ICTP's permanent faculty of distinguished scientists conducts rigorous world-class, curiosity-driven research in frontier and interdisciplinary science ranging from string theory and cosmology to quantum computing, climate science, and quantitative life sciences. They teach and mentor hundreds of students and young researchers every year, equipping them to go on to study, teach, and conduct research in the world's finest universities, and to contribute to the development of science in their home countries.

ICTP: Research Excellence

ICTP is passionately committed to scientific enquiry at the highest level. Research here has led to major breakthroughs in areas ranging from the unification of fundamental interactions and the theory of neutrino oscillations to climate modelling. More recently, cross-disciplinary research is paving the way for advances in quantum technologies and Artificial Intelligence.



ICTP supports research groups in several areas of physical sciences and mathematics. From its early focus on theoretical high energy physics, the Centre's research areas have evolved in response to the needs of physicists and mathematicians from disadvantaged countries, and now include the following:

- → High Energy, Cosmology and Astroparticle Physics (HECAP)
- → Condensed Matter and Statistical Physics (CMSP)
- → Mathematics (MATH)
- → Earth System Physics (ESP)
- → Quantitative Life Sciences (QLS)
- → Science, Technology and Innovation (STI)

ICTP takes a long-term view, investing in the future and identifying emerging directions ahead of its time. A new ICTP initiative is underway to create an international consortium on scientific computing. The goal of the consortium is to provide scientists from around the world, especially from developing countries, with an integrated platform to exchange information, access resources, receive training, and contribute to the advancement of this rapidly evolving and expanding area of research, touching on climate modelling and AI.

Research at ICTP has been linked, directly or indirectly, to five Nobel prizes. For example, the work of ICTP emeritus scientist Alexei Smirnov gave the theoretical underpinning, decades ahead of its time, for the 2017 Nobel prize in experimental neutrino physics. ICTP physicist Filippo Giorgi was a co-recipient of the 2007 Nobel prize to the IPCC as its vice chair; he headed our Earth System Physics section, which was started two decades ago recognising the scientific importance and societal relevance of climate science.

ICTP's work at the very frontiers of research makes us a destination of choice for leading physicists and mathematicians from all over the world. **Over the years, some 106 Nobel laureates, 20 Fields medallists, and members of our distinguished Scientific Council have spent time at ICTP,** offering unparalleled opportunities for the brightest minds in the world, whether established- or early-career scientists, to learn from each other.

ICTP: Committed to the Developing World

Everyone gains from the diversity of perspectives created by ensuring that scientists are empowered and can contribute to scientific discourse independently of geography, gender, class, or ethnicity.

ICTP works to transcend these potential barriers through its scientific programmes, with direct financial support, training and education. The Centre is committed to ensuring that the widest possible range of scientists is able to participate in all of its scientific activities to help bridge the knowledge divide.

Science is a powerful driving force in the success of any nation, contributing to its economic well-being and the individual fulfilment of its people. Many countries, however, do not have the infrastructure or educational provision to support the growth of science and technology and to keep pace with other parts of the world.

This affects the intellectual and professional development of individual scientists. Young scholars can also find it hard to qualify for rigorous PhD programmes. ICTP's **Postgraduate Diploma Programme** was designed to help them; nearly 90% of those who have earned the Centre's Diploma, many of whom come from the most disadvantaged parts of the world, advanced to competitive master's or doctoral degree programmes. Once they have finished their PhDs, ICTP continues to support them in various ways, helping them gain the training, experience, and employment they need to lead productive scientific careers.

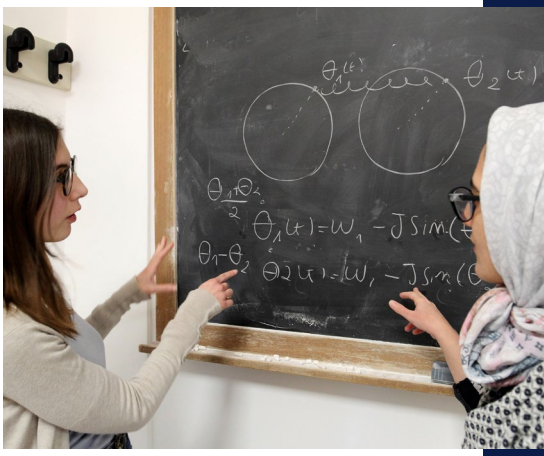
ICTP, in collaboration with local universities, **offers postgraduate study opportunities to scientists from the developing world,** helping them attain master's and doctoral degrees. Thanks to these collaborations, students from disadvantaged countries can pursue postgraduate degrees in various fields of physics and mathematics.

In addition, the Centre's **Sandwich Training Educational Programme (STEP)** offers fellowships to PhD students from developing countries who are studying physics, mathematics and related fields to visit ICTP or a collaborating institute for a three- to six-month stay each year for up to three successive years. Fellows work on their PhD theses with their advisors at their home institutes and co-advisors at the hosting institutes. Their PhD is awarded at their home institutes.

Further training opportunities exist through ICTP's **Training and Research in Italian Laboratories (TRIL)** programme, supporting stays of up to one year for scientists from developing countries at Italian research laboratories in universities, governmental facilities and private institutions.

Scientists who return to their own countries often face onerous and taxing demands that can overwhelm them personally and professionally, to the ultimate detriment of the very scientific capacity they are striving to develop. Also, the intellectual isolation they experience may constrain the sense of confidence that would emerge if they could contribute to the mainstream of their fields. ICTP's long-running **Associates Programme** supports active researchers, giving them time and space to visit the Centre over a period of time to do science within a rich and stimulating intellectual environment. The long-term association with ICTP and opportunities for international collaborations help them sustain their efforts back home.

ICTP supports research and training activities of physicists and mathematicians living and working in developing countries, primarily by providing assistance for regional activities. Such support complements the training and research that is provided to developing-country scientists at ICTP. **Our goal is to boost the scientific level of individuals, groups or institutes in developing countries to an international level** through North-South collaboration, and to stimulate networking of scientists in the developing regions to reach a critical mass of researchers through South-South collaboration. Assistance



is coordinated by ICTP's **External Activities Unit,** through which ICTP directly supports postgraduate courses and students as well as early career scientists in **Affiliated Centres,** research group networks, scientific meetings, and visiting scholars and consultants.

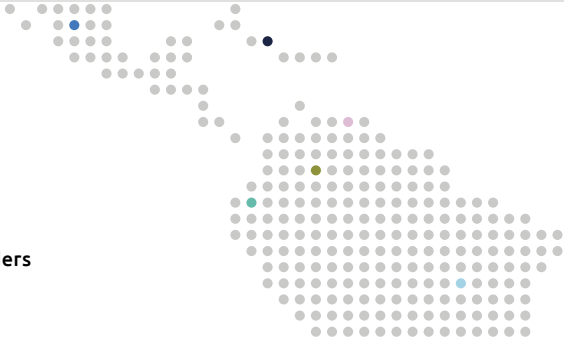
ICTP recognises the importance of inspiring young scholars to pursue science careers. Its **Physics Without Frontiers (PWF)** programme organises projects that aim to motivate, train, and mentor physics and mathematics university students worldwide, with a focus on countries in the Global South, to help build the next generation of scientists. Each project is unique, combining hands-on training, lectures and networking, developed with a country's specific needs in mind. In order to make this possible, PWF works with volunteer scientists – PhD students, postdoctoral researchers, or lecturers from all over the world – who are passionate about promoting and supporting physics and mathematics.

ICTP: A Hub of International Scientific Cooperation

ICTP is committed to science advocacy and international cooperation through science by providing an international forum of scientific contact for scientists from all countries.

Support from the Italian government, the IAEA and UNESCO, has helped ICTP become an international scientific hub of excellence linking scientists from developing countries with their colleagues worldwide, overcoming intellectual isolation and helping build a strong scientific base around the world so that all countries can play their rightful role in the global science community.

The choice of Trieste, a strategically located city in Italy whose history has been defined by shifting political boundaries, symbolises ICTP's commitment to international cooperation through science. This commitment was reinforced when UNESCO designated ICTP as a Category 1 institute to build scientific capacity in developing countries.



ICTP FOSTERS INTERNATIONAL COOPERATION THROUGH SCIENCE IN A NUMBER OF WAYS:

6,000

Activity participants

by supporting an annual programme of advanced workshops and conferences that explore topics at the cutting edge of physics and mathematics, attracting more than **6,000 world-leading and early career scientists** from more than **150 countries** every year.

Active

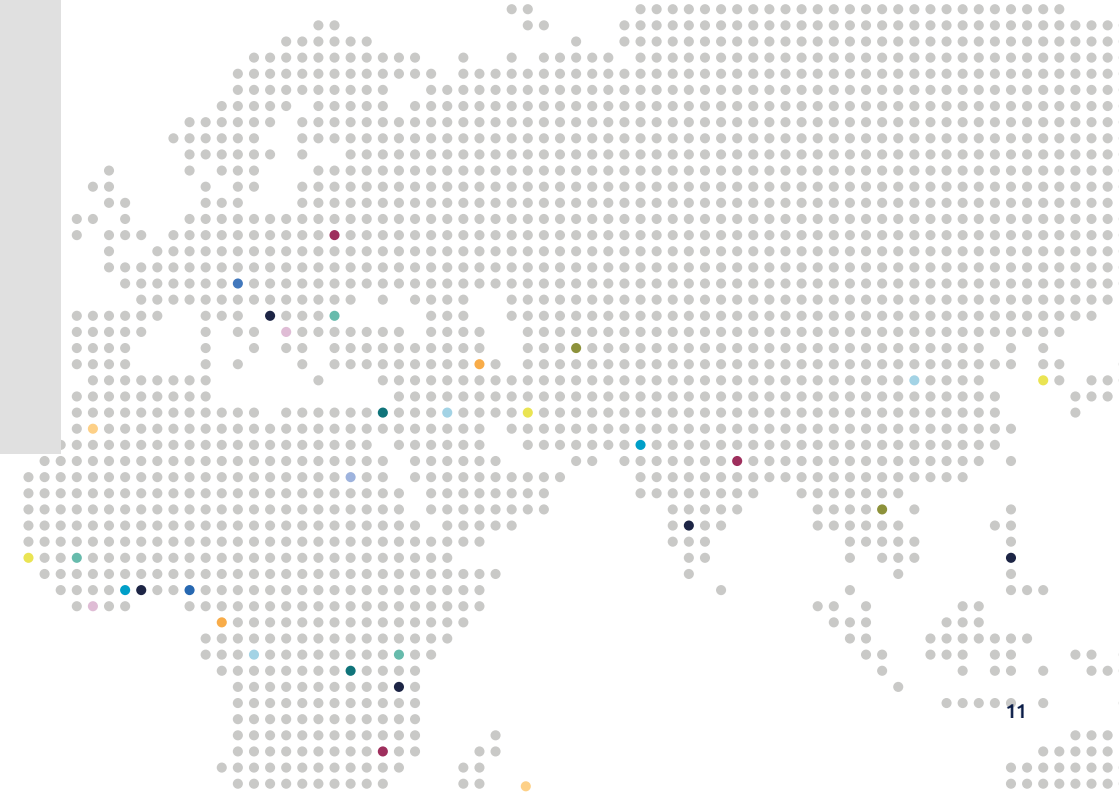
Engagement

by actively engaging, via research partnerships and collaborations, with some of the world's top physics and mathematics research institutes.

4

Partner institutes

by fostering international, scientific dialogue in the developing world. Our four partner institutes in **Brazil, China, Rwanda, and Mexico** give scientists in those countries access to our networks, expertise, and convening power.



ICTP's Trieste Campus

Located on scenic, wooded hills above the Adriatic sea, close to the northern Italian city of Trieste, ICTP's residential and community facilities make any researcher's experience at the Centre unique, promoting informal social and intellectual interactions in which ideas are discussed over meals or coffee.

Resources such as the ICTP Library – one of Europe's finest research libraries – and high-performance computing facilities enhance ICTP's rich intellectual atmosphere.

ICTP GUESTHOUSES

Located just a few meters away from the sea, and next to the Miramare castle and grounds, the Adriatico Guesthouse is a highlight of any visitor's stay at the Centre. With about 100 rooms, the guesthouse can welcome more than 150 visitors.

The building also houses three lecture halls, where conferences, seminars and workshops regularly take place, two informatics laboratories, as well as a cafeteria and a coffee bar, where collaborations and friendships are born.

ICTP's Galileo Guesthouse, a short distance uphill from the main campus, can accommodate more than 70 visitors. The building houses a common area equipped with vending machines, a microwave oven and kitchen facilities, as well as smaller lecture and meeting rooms.

ICTP LIBRARY

Since the founding of the Centre, the ICTP Library has played a crucial role in advancing ICTP's mission to support scientific advancement across the world, and particularly in the Global South. ICTP visitors have used the ICTP Library as an invaluable resource to access books and journals not available in their own country.

In a continuous push to keep pace with the fast-evolving world of scientific publications, the ICTP Library has significantly increased its catalogue of e-books and e-journals. The whole ICTP community can now download and read an ever-growing number of online resources, as part of the Centre's ongoing effort to enhance its digital offerings.

The ICTP Library helps to advance the Centre's mission by fostering open science. The historical ICTP Book Donation Programme, launched by Abdus Salam to provide libraries in the developing world with advanced science books, has evolved: with fewer printed books shipped around the world, the ICTP Library now uses part of its budget to support open access initiatives that make science available to everyone, everywhere in the world, for free.

Explore ICTP

For more details about ICTP's research, programmes and services, visit our website at **www.ictp.it**, or follow us on social media (Facebook, X, Instagram and LinkedIn).

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