

# International Center for Theoretical Physics, Italy

For more than 50 years, the Abdus Salam International Centre for Theoretical Physics (ICTP) has been a driving force behind global efforts to advance scientific expertise in the developing world.

Founded in 1964 by the late Nobel Laureate Abdus Salam, ICTP seeks to accomplish its mandate by providing scientists from developing countries with the continuing education and skills that they need to enjoy long and productive careers. ICTP has been a major force in stemming the scientific brain drain from the developing world.

## Mission & History

### An institute run by scientists for scientists

ICTP's mission is to:

- Foster the growth of advanced studies and research in physical and mathematical sciences, especially in support of excellence in developing countries.
- Develop high-level scientific programmes keeping in mind the needs of developing countries, 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 of scientific inquiry for the entire ICTP community.

Thanks to the generous funding from the Italian Government, UNESCO and the IAEA, ICTP has been able to initiate and implement various schemes of support and assistance to scientists from developing countries.

### History

For more than 50 years, ICTP has been ensuring that scientists from the developing world have access to the same resources and opportunities enjoyed by their counterparts in wealthier parts of the world.

Created during the Cold War era in the heart of Europe, a continent separated by the iron curtain, ICTP provided a rare line of communication between scientists from the East and West. Later, ICTP emerged as a focal point of cooperation between the North and South, aiming to help scientists from developing countries overcome their isolation and contribute to state-of-the-art research in physics and mathematics. While details have changed with time, the basic relevance of the Center has remained unchanged.

The importance of ICTP's UN partner, the IAEA, in its creation cannot be overstated. It was in 1960 at the IAEA's Fourth General Conference that a 34-year-old physicist from Pakistan, future Nobel laureate Abdus Salam, suggested the founding of an international theoretical physics institute. In June of that year, the Department of Physics at the University of Trieste organized a seminar on elementary particle physics in the Castelletto in the Miramare Park, also attended by Abdus Salam. The notion of creating an institute of theoretical physics open to scientists from around the world was discussed at that meeting as well.

That proposal became a reality in 1963 when the General Conference of the IAEA signed an agreement with the Italian Government to establish ICTP in Trieste. The following year, the Centre opened its doors, with Abdus Salam as the Centre's director, and Paolo Budinich, a physics professor at the University of Trieste who worked tirelessly to bring the Centre to Trieste, as ICTP's deputy director.

## **Programmes offered by ICTP**

There are different programs at ICTP, some of them are listed below:

- Pre- PhD programmes for undergraduate students
- Sandwich Training Education Program
- PhD programs in Physics and Mathematics
- Different career development programs such as Associate schemes, affiliated institutes schemes and different conference and workshops for early age and experienced researchers and scientists.
- Scientific outreach activities in scientifically lagging countries.
- Women in Science is a special program for female scientists in the developing countries.

## **Office of External Activities**

### **Building sustainable science in the developing world**

ICTP is actively involved in building scientific capacity in the developing world through its Office of External Activities (OEA).

The OEA promotes scientific cooperation in developing countries through its support of scientific meetings, networks, affiliated centres, and visiting scholars. OEA activities are initiated by scientists and scientific institutions in the developing world and are carried out at sites located within the region. Its purpose is threefold:

- To initiate, stimulate or make applicable research and training in the fields of physics and/or mathematics related to locally available resources or local problems of specific relevance to the development of the region.
- To form and strengthen national and regional communities and research groups by supporting institutions or national societies for physicists and mathematicians at all levels.

- To enhance physics and mathematics teaching.

Assistance is carried out within the following schemes:

- **Affiliated Centres:** The programme offers a limited number of fellowships to students from developing countries, other than the host country, who wish to pursue a postgraduate course leading to a PhD or master degree at one of the ICTP Affiliated Centres. OEA will be responsible for making the selection of those fellows supported by ICTP. The faculty members who have agreed to act as tutor/supervisor of the students will collaborate closely with ICTP scientists to follow the progress of the fellows.
- **Network Programme:** An ICTP Network is a system of research groups in an entire region, or among different regions, that pursue a common scientific project over an extended period.
- **Scientific Meetings:** OEA encourages the organization of international and regional scientific meetings in developing countries by offering financial assistance to the organizers of conferences, workshops, and schools.
- **Visiting Scholars/Consultants:** This programme promotes collaboration between scientists in developing countries and leading scientists throughout the world. The Visiting Scholar/Consultant is required to make at least two research visits over three years, each lasting at least a month, during which they are expected to carry out joint research with their counterparts and deliver lectures in their fields of expertise.
- **Collaborations:** The OEA collaborates with other institutions in promoting research and training in physics and mathematics in developing countries. In particular, there are collaborations with the Centro Latino-Americano de Física (CLAF) that include research exchange visits and sandwich PhD programmes.

#### WHO CAN APPLY:

- **Affiliated Centres:** An institute or university department of physics or mathematics in a developing country that has a well established or is in the process of setting up a postgraduate course leading to a PhD or Master degree.
- **Network Programme:** Institutes or individuals in developing countries with common scientific interests who agree upon a well-defined joint project that emphasizes collaboration and the sharing of expertise and facilities.
- **Scientific Meetings:** Institutions in developing countries that want to organize international and regional scientific meetings in developing countries.
- **Visiting Scholars/Consultants:** Institutes or research groups in a developing country requiring expert advice to enhance existing activities or to initiate a new research programme.

## Programme for Training and Research in Italian Laboratories

**The TRIL Programme offers scientists from developing countries the opportunity to undertake training and research in an Italian laboratory in different branches of the physical sciences.**

The aim of the programme is to promote, through direct contacts and side-by-side high-level research, collaborations between the Italian scientific community and individuals, groups and institutions in developing countries. This programme thus addresses an important aspect of the mission of ICTP, namely to help form and strengthen a permanent scientific expertise in developing countries, cognisant of local needs and resources and of the frontiers of science and technology, and to provide support towards a sustainable capacity in basic and applied research that can help their nations' progress.

Pakistani Scientist at ICTP

There are few associates of ICTP in Pakistan

Dr Shahid Ali from National Center for Physics, Islamabad,

Dr Imrana Ashraf from Quaid E azam University,

Dr Jehan Akbar from Hazara University).

LUMS and NUST are affiliated institutes of ICTP.

So far three scientists from Pakistan <sup>have</sup> has been awarded ICO-ICTP Gallieno Denardo Award for their contribution to Science and Technology

- (1) Dr Arbab (Quaid e Azam University, 2000)
- (2) Dr Imrana Ashraf (Quaid e azam University, 2004)
- (3) Dr Jehan Akbar ( HAZARA University Mansehra, 2016,2018)

Dr Jehan Akbar has been awarded TRIL fellowship of ICTP in 2016.