

50 YEARS ICTP AND ITS ACTIVITIES IN THE FIELD OF MEDICAL PHYSICS

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Abstract – ICTP (the Abdus Salam International Centre for Theoretical Physics) is an unique institution aiming to support the development of science knowledge in developing countries. It has supported the medical physics profession for more than 30 years. Many of the medical physicists from the developing countries have undergo training in the regular ICTP College on Medical Physics (starting from 1983). Last year ICTP initiated a regular School of Medical Physics (Radiotherapy) and an MSc Programme on Medical Physics. Acknowledging this support for the profession IOMP presented ICTP with its Plaque of Gratitude on the occasion of the ICTP Golden Jubilee this year.

This year ICTP (the Abdus Salam International Centre for Theoretical Physics) celebrates its Golden Anniversary. This international research institute for physical and mathematical sciences operates under a tripartite agreement between the Italian Government, United Nations Educational, Scientific and Cultural Organization (UNESCO), and International Atomic Energy Agency (IAEA). ICTP was founded in 1964 by Mohammad Abdus Salam, a Nobel Laureate in Physics of Pakistani nationality. The Centre buildings are in Trieste, Italy. The mission of ICTP is: To foster the growth of advanced studies and research in physical and mathematical sciences, especially in support of excellence in developing countries; To 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; To conduct research at the highest international standards and maintain a conducive environment of scientific inquiry for the entire ICTP community. The Centre is an institution that is run by scientists for scientists. It regularly hosts meetings with Nobel Award winners and encourages research and teaching in physics.

By coincidence Abdus Salam was connected with medical physics through his Nobel Award in 1979, when he receives the Nobel in Physics (for the electroweak theory), together with Godfrey Hounsfield and Allan Cormack, receiving Nobel in Medicine (for the X-ray Computed Tomography).



Nobel Award winners 1979, including Abdus Salam (third from right), Godfrey Hounsfield and Alan Cormac (first and third from left) – image courtesy to ICTP Archives

The medical physics activities in ICTP had been initiated soon after - at the beginning of 1980-ties by Prof. Giorgio Alberi (ICTP) and a group of medical physicists including Anna Benini, John Cameron and Sergio Mascarenhas, and have been firmly supported by Prof. Luciano Bertocchi, Deputy Director of ICTP.

The first medical physics activity in ICTP took place in 1982 - an International Conference on the Applications of Physics to Medicine and Biology in 1982 (organised by Giorgio Alberi). Another successful conference and several workshops were organised in the following years, revealing the need of medical physics education for the Third World countries. On this background ICTP expanded their training activities in medical physics. This way the first College on Medical Physics took place in 1988. The regular series of Colleges begun in 1992 and since this time it runs on a regular basis (usually bi-annually).

From the beginning corner stones for the ICTP involvement in Medical Physics were Luciano Bertocchi (then Deputy Director of ICTP) and Anna Benini (then IAEA Officer). Additionally, a number of prominent professionals were engaged with the College on Medical Physics, including John Cameron (USA), Sergio Mascarenhas (Brazil), Perry Sprawls (USA) and Slavik Tabakov (UK). The current Co-Directors include also Franco Milano (Italy), George D Frey (USA) and Mario De Denaro (Italy).



ICTP International College on Medical Physics – students and Co-Directors, September 2010

The transfer of knowledge and experience to the developing countries is a major objective of the College. Each participant receives a full set of lecturing materials, including Power Point slides, e-Learning materials, access to web sites, etc. These have triggered tens of Medical Physics activities and courses in the developing countries and helped hundreds of colleagues from these countries to practice the profession. Due to this reason the College is always one of the most over-subscribed training activities of the ICTP. Some students from the College also take part in research activities organised by ICTP, namely as Associate Members and as participants in the Programme of Research and Training in Italian Laboratories (TRIL).

Alongside the College (focussing on Medical Imaging and Radiation Protection), ICTP hosts many other medical

physics workshops, courses and conference, mainly related to IAEA activities. During 2005 ICTP was Co-organiser of the High-level UNESCO-led Conference in Durban “Physics and Sustainable Development”. One of the decisions of this Conference was to identify areas of special interest for applied physics during the XXI century – one of these areas was agreed as “Physics and Medicine”.

ICTP also took active part in the International projects EMERALD, EMIT and EMITEL, developing new e-learning and training materials in medical physics, as well as the first Medical Physics Encyclopaedia EMITEL. This way the first International Conferences for Medical Physics Training were held in ICTP, Trieste (1998, 2003, 2008).



EMITEL Medical Physics Encyclopaedia Conference, ICTP, November 2008
(the photo includes members of EMITEL project Consortium and Network, as well as Past and Present Presidents of IOMP and 21 National Medical Physics Societies and Regional Federations)



Inauguration of the new MSc course in Medical Physics, February 2014
(the photo includes the students, the Course Directors and Board, the EFOMP President,
the Head of the IAEA Human Health Division, the Rector of University of Trieste and the Director of ICTP)

ICTP also Co-organised medical physics activities outside Trieste – e.g. the Medical Physics College in Mumbai India (2007) and the Radiotherapy School in Guatemala (2013)

During 2013-2014 the ICTP medical physics activities expanded by organising a dedicated Master Programme in Medical Physics (led by Renata Longo and Renato Padovani). This MSc operates as a joint programme (in English) with the University of Trieste and is specially directed to students from developing countries. From the beginning IOMP supported this MSc programme, which attracted significant interest (for 2014 the programme received 440 application from developing countries).

Another new activity, initiated by Renato Padovani in 2013, is the new Radiotherapy School, headed by M DeDenaro, G Hartmann, M R Malisan and R Padovani. From 2015 the School will be a regular medical physics activity in between the years of the Medical Physics College. The School will include as Co-Directors also C Orton (IOMP), G Hartmann (EFOMP) and Y Pipman (AAPM).

From its foundation ICTP has been a pivot for the dissemination and development of various fields of physics in the world and in particular – in the developing countries. The medical physics activities organised by ICTP have helped thousands of young medical physicists from developing countries to firmly enter the profession and further spread the knowledge in their countries and regions. The International Organization for Medical Physics (IOMP) congratulates sincerely ICTP with its 50th anniversary and expresses its high appreciation and gratitude to the Centre as one of the strongest supporters of the medical physics profession.



Presenting an IOMP Plaque to ICTP Director Prof. Fernando Quevedo
at the 50th Anniversary ICTP Conference, 7 Oct 2014

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ANNEX

The International College on Medical Physics (2014) included also a Poster session where students described the professional development and education/training activities in their countries. These Poster sessions, initiated 10 years ago are now an important part of the College, aiming exchange information and expertise between students, as well as helping the focus of the international activities supporting the global development of the profession.

The 2014 College had a focus on Africa and included a number of colleagues from the continent (some suggested by FAMPO – the Federation of African Medical Physics Organisations, a Regional Federation of IOMP). The best posters and presentations received the Binesh Award and an ICTP Diploma. Here below is a list of all Posters presented. The Award-winners authors have been asked to submit short paper for publication at the Medical Physics International. Here we include the presentations from Ghana and Bangladesh.

List of Poster presentations at

ICTP College on Medical Physics (Advances in Medical Imaging Physics to Enhance Healthcare in the Developing Countries): 1/09/2014 – 19/09/2014

Medical physics in Vietnam, *Trinh Thi Mai*

Status of medical Physics In The United Republic of Tanzania, *W.E. Muhogora*

Overview of Medical Physics in Iran, *Afsaneh Lahooti; Hossein Aslian*

Medical Physics in Zimbabwe, *Edwin Mhukayesango*

Medical Physics in Indonesia: 'Nuclear for Welfare', *Eka Djatnika Nugraha*

Medical Physic Profession Uganda, *Musisi Alen*

Medical Physics Professional Status in Nepal, *Ram Narayan Yadav*

Academic Education, Clinical Training and Professional Recognition of Medical Physicist in Argentina, *Ruggeri Ricardo Miguel*

Present Status of Medical Physics in Bangladesh, *Hasin Anupama Azhari, M. N. Hossain*

Medical Physics Status in Cuba; Current Situation and Future Development, *Haydee Maria Linares*

Status of Medical Physics Education and Training in India, *Yalavarthy K. Phaneendra*

Development of Radiation Protection and Medical Imaging in Malaysia, *Anis Suhana Ahmad Sabri, Noor Zaimah Zainol Abidin*

Medical Physics Education in Turkey and the Statistical Distribution of CT, MRI and Mammography Devices, *Kandemir Recep*

Medical Physics in Ghana, *E. K. Sosu, F. Hasford, T. B Dery, E.W. Fiagbedzi, Y. Serfor-Armah, A W K Kyere*

Advances in Medical Imaging Physics to Enhance Health care in Developing Countries -Eritrea, *T. H. Tectlehaimanot*

Medical Physics Education, Training and Professional Status in Brazil, *MARTINS Juliana Cristina, SANTOS Josilene Cerqueira, REINA Thamiris*

Medical Physics at Institute of Nuclear Physics in Tashkent, Uzbekistan, *JURAEVA Nozima*

Medical Physics Development in Serbia, *CEKLIC Sandra*

Education and Clinical Training of Medical Physics in Thailand, *Kitiwat KHAMWAN, Thunyarat CHUSIN*

Control of Unwarranted Radiation Exposures in Medical Applications – Sri Lanka, *Gunaratna Mudiyansele, Nadeera Hemamali*

Medical Physics Applications and Actions in Mexico, *Medel Baez Eva*

Medical Physics in the Philippines, *Taguba Dona May Opiniano, Margallo Victor Angelo Caballero*

Advance in Medical Imaging in Zambia, *Nkonde Kangwa Alex*

Inclusion of Medical Physicists in Radiology – Venezuela, *Yanez Sanchez Miguel Angel*

Medical Physics in the Sudan: Continuous Development and Innovation, *Ahmed Murtada Ahmed*

Status and Progress of Ethiopia in Medical Physics, *Gebre Mesay Geletu, Yacob Alemiye Mamo*

Medical Physics Development in Nigeria: Personnel and Equipment, *AKPOCHAFOR Michael Onoriode, ARAGBAYE Adebola, EVWIERHURHOMA Omuvwie Bernard, ISIAKA Babatunde*

Awards were distributed to the Posters/Presentations from the following countries: Bangladesh, Cuba, Ghana, Sudan, Thailand