

# INTERNATIONAL UNION FOR PHYSICAL AND ENGINEERING SCIENCES IN MEDICINE (IUPESM) 40<sup>TH</sup> ANNIVERSARY

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**Abstract– The International Union for Physical and Engineering Sciences in Medicine (IUPESM) celebrates this year its 40<sup>th</sup> anniversary. The paper presents a short history of the IUPESM (the Union formed of IOMP and IFMBE) and its very important activities for the global recognition of our professions. The paper underlines the role of IUPESM in representing our professions at the highest level of scientific and professional organizations. The paper also lists the main activities of IUPESM.**

The International Union for Physical and Engineering Sciences in Medicine (IUPESM) started its activities in January 1980 as a Union of the International Organization for Medical Physics (IOMP) with the International Federation for Medical and Biological Engineering (IFMBE) [1].

The necessity of forming a Union to represent both sister professions was recognised during the 1970s. At that time IOMP was an Associated Commission of the International Union for Pure and Applied Biophysics (IUPAB) while IFMBE was a member of the Council of International Organizations for Medical Science. However both organisations believed that their scientific affiliation would be stronger if both joined forces and as a Union and become directly a member to the International Council of Scientific Unions (ICSU). This would be recognition of medical physics and biomedical engineering as specific branches of science and would allow further IUPESM activities for the recognition of the two professional occupations by the International Labour Organisation. The idea was a very long term strategy at that time, but was the most important decision taken by both organisations.

In 1975 a committee between IOMP and IFMBE was formed with IOMP represented by Prof. R. L. Clarke, and IFMBE represented by Dr. J A Hopps. They prepared a paper to be discussed by both organizations at the joint meeting in 1976. Both colleagues proposed the name of the Union “The International Union for Physics and Engineering in Medicine”. That was agreed to at a joint IOMP/IFMBE meeting at Ottawa during the 4<sup>th</sup> ICMP which was organised specifically to follow the IFMBE Conference in the same venue in Ottawa) [2].

In 1979 both organisations, IOMP and IFMBE, held their International Conferences together in Jerusalem – the International Conference on Medical Physics (ICMP) and the International Conference on Medical and Biological Engineering (ICMBE). This joint activity was recognised as the 1<sup>st</sup> World Congress on Medical Physics and Biomedical Engineering. At this event in Jerusalem the Councils of both Organisations discussed and agreed to the draft Statutes of the IUPESM.

In January 1980 IUPESM was established as an Organisation uniting medical physicists and biomedical engineers. Its Founding President was chosen to be the then IOMP President – Prof. John Mallard. At that time the joint workforce of IUPESM (IOMP+IFMBE) was 20,000 members in 54 countries.

The IUPESM officers initiated immediately the activities for linking our professions with the largest and most powerful International Scientific Organisation – ICSU (International Council of Scientific Unions).

ICSU is one of the oldest scientific non-governmental organisations in the world. It was formed in 1931 and by 2017 it had 122 multi-disciplinary National Scientific Members, Associates and Observers representing 142 countries and 31 international, disciplinary Scientific Unions and 22 Scientific Associates. Becoming a member of ICSU was an immediate recognition of the two scientific fields medical physics and biomedical engineering.

The memoirs of Prof. Mallard [3], who has guided all initial discussions with ICSU, present a brief picture of this very important and long process. IUPESM application to ICSU was supported by the National Academies of the countries, founders of IOMP – USA, Canada, Sweden and UK. The application was also supported by several Scientific Unions member of ICSU – the International Union of Pure and Applied Physics, the International Union of Pure and Applied Chemistry and the International Union of Biochemistry and Molecular Biology. A large IUPESM application was submitted to ICSU. However ICSU insisted to have an

assessment period, hence an application should be made for Associate Membership. Another application was prepared in 1982 and, based on it, in 1983 IUPESM was accepted as an ICSU Associate Member.

In 1997 a meeting between ICSU and IUPESM gave a green light for a new application for Full Membership. This time the process was driven by Prof. Keith Boddy - President of IUPESM (and Past-President of IOMP). Another substantial application was prepared in 1999. Based on it ICSU accepted unanimously IUPESM as its full member in September 1999. IUPESM was the 27<sup>th</sup> Scientific Union member of ICSU. This major success was a true recognition for our scientific fields. Since that time, now over 20 years, IUPESM has sustained this achievement and takes part in all ICSU meetings. In 2008 ICSU elected one of the IUPESM representatives, Prof. Dov Jaron, as member of its Executive Committee. In 2018 ICSU merged with the International Social Science Council (ISSC). Both formed the International Science Council (ISC). IUPESM became a full member of ISC.

After the recognition of the two scientific fields IUPESM increased its activities in another very important direction – the recognition of both professional occupations (of medical physicists and biomedical engineers) by the International Labour Organization (ILO) in Geneva. It was through ILO, that the professional occupations could be included in the International Standard Classification of Occupations (ISCO). This was of great importance in many countries, as ISCO, an extensive document of over 400 pages assigns specific code numbers to each recognised professional occupation. The lack of such specific codes for medical physicists or biomedical engineers resulted in some cases in undesirable employment of our colleagues under different recognised professional occupations (often with lower qualifications and remuneration).

Many IUPESM officers took part in the discussions with ILO, among them – Prof. Colin Orton, Prof. Azam Niroomand-Rad, Prof. Joahim Nagel, Prof. Fridtjof Nuesslin, Prof. Peter Smith.

The initial suggestion was to include our professions in the listing of Health professionals. However this appeared to be a long path. Finally, after many discussions, ILO decided to align the two professions with science and engineering and a note was added to clarify their position in relation to other health professions. Thus both professional occupations were included in ISCO-08, which came in force in 2012 – medical physicists are listed under Unit Group 2111, and biomedical engineers under Unit Group 2149. This was another huge achievement of IUPESM [4].

To celebrate this achievement IOMP established in 2013 the International Day of Medical Physics (IDMP) –

7<sup>th</sup> November (the birthday of Maria Sklodowska Curie). Now it is celebrated globally.

These recognitions could only be achieved by a joint Union of the two professions, which together can overcome the relatively small number of specialists in each one.

The current IUPESM activities are administered by a number of committees, including: Congress Coordinating Com; Awards Com; Education and Training Com, ISC Liaison Com; Union Journal Com; Public and International Relations Ad-hoc Com; Rules Com; IUPESM Data Com; Women in Medical Physics and Biomedical Engineering Task Group. In 2011 the Education and Training Committee published a book about academic programs in various countries (Ed. S Tabakov, P Sprawls, A Krisanachinda, C Lewis) [5].

In 2012 IUPESM set up a Health Technology Task Group (HTTG) intended to assist countries in defining their health technology needs, and identifying and rectifying health system constraints for adequate management and utilization of health technology, particularly through training, capacity building and the development and application of appropriate technology. In 2017 the HTTG published the book *Defining the Medical Imaging Requirements for a Rural Health Center* (Ed. C Borrás) [6].

The main IUPESM publication is the Journal ‘Health and Technology’ (Springer), which has a number of regular and special issues bridging subjects of interest of both medical physicists and engineers [7]. In 2018 IUPESM set up a new activity (headed by M Stoeva and P Lin) for organizing joint Workshops between medical physicists and biomedical engineers.

A main task of IUPESM is to lead and coordinate the triennial “World Congress on Medical Physics and Biomedical Engineering”. The Union has organized all World Congresses since 1979 (Jerusalem) and is currently preparing for the World Congress 2021 in Singapore [8].

The IUPESM General Assembly is the highest authority of the Union and determines its general policy. It consists of representatives of the Constituent Organizations. The Administrative Council conducts the business of the IUPESM between sessions of the General Assembly. The current members of IUPESM Administrative Council are: Prof James Goh (President, Singapore), Prof Slavik Tabakov (Vice-President, UK), Prof Kin Yin Cheung (Past-President, Hong Kong), Prof Leandro Pecchia (Secretary General, UK), Prof Magdalena Stoeva (Treasurer, Bulgaria), Prof Madan Rehani (President IOMP, USA), Prof Shankar Krishnan (President IFMBE, USA), Prof John Damilakis (Vice-President IOMP, Greece), Prof Ratko Magjarevic (Vice-

President IFMBE, Croatia), Prof Eva Bezak (Secretary General IOMP, Australia), Prof Kang Ping Lin (Secretary General IFMBE Taiwan), Prof Geoff Ibbott (IOMP, USA), Prof Stephen Keevil (IOMP, UK), Prof Timo Jamsa (IFMBE, Finland) and Prof Marc Nyssen (IFMBE, Belgium).

Currently IUPESM represents about 150,000 members from over 100 countries. To celebrate its 40<sup>th</sup> anniversary IUPESM approved a Fellowship scheme.



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IUPESM Leadership (part) at IUPESM World Congress on Medical Physics and Biomedical Engineering, Prague, Czech Republic, June 2018