



IUPESM milestone developments and achievements during 1980–2022—a tribute to the contributors

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Abstract

During 2020 the International Union for Physical and Engineering Sciences in Medicine (IUPESM) celebrated its 40th anniversary. At that time a paper was prepared tracing the main steps for the creation of the IUPESM (the Union formed of IOMP and IFMBE) and its very important activities for the global recognition of the professions [1]. The current paper, prepared by the IUPESM President, Vice-President and Past President, presents a chronology of the IUPESM Milestone Developments and Achievements and pays tribute to the main contributors for these achievements.

Keywords Professional development · History · IUPESM history · International medical physics and biomedical engineering history

1 Introduction

A number of discussions had taken place during 1970s between eminent medical physicists and biomedical engineers, representing respectively the International Organization for Medical Physics (IOMP) and the International Federation for Medical and Biological Engineering (IFMBE). Thus in 1980 a Union has been formed – IUPESM, with IOMP and IFMBE as Constituent organisations [1]. This has been very important in order to apply effectively to membership of ICSU (International Council of Scientific Unions, now ISC—International Science Council). The necessity for this is described by one of the founders and Inaugural President of IUPESM, John Mallard: “...*ICSU acts as a world focus for science, and as a spokesman and advisor for world science. It is clear, then, that membership of ICSU is full recognition of one's field at the world level and that this recognition passes back to each individual national Academy and Government. In order to apply to join, we had to*

have a scientific Union. It was clear to me that if we could set-up a body which could bring together IOMP and IFMBE, we had a Union which could speak for the whole of our field and which could apply for membership of ICSU.” [2]

The principal objectives of IUPESM, developed and agreed in 1979 are [3]:

- (a) to contribute to the advancement of physical and engineering science in medicine for the benefit and wellbeing of humanity;
- (b) to organize international cooperation and promote communication among those engaged in health-care science and technology;
- (c) to coordinate activities of mutual interest to engineering and physical science within the health care field, including international and regional scientific conferences, seminars, working groups, regional support programs and scientific and technical publications;
- (d) to represent the professional interests and views of engineers and physical scientists in the health-care community.

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2 IUPESM milestone developments and achievements

The Milestone developments of IUPESM can be grouped as follows:

1979, August – IOMP and IFMBE hold Conferences simultaneously in Jerusalem, Israel. Both Organisations agree the draft Statutes of IUPESM. It was later agreed the Conferences in Jerusalem to be named 1st IUPESM World Congress on Medical Physics and Biomedical Engineering (major role for this had John Mallard, Robert L. Clarke and Jack Hops);

1980, January – IUPESM began its official existence (President: John Mallard; Vice-President: Masao Saito; Secretary General/Treasurer: Robert Clarke).

1982, September – 2nd IUPESM World Congress organised in Hamburg, Germany—Co-Presidents: Dietrich Harder (IOMP) and Walter Bleifeld (IFMBE);

1983 – IUPESM is accepted as Associate Member of ICSU (the International Council of Scientific Unions)—the oldest scientific Union, now renamed to International Science Council (ISC). This membership is an important part of the recognition of the scientific fields of medical physics and biomedical engineering (main contributors: John Mallard, Robert Clarke, Jack Hops, Masao Saito);

1985, August – 3rd IUPESM World Congress organised in Helsinki (Espoo), Finland—Co-Presidents: Tapani Jauhainen (IOMP) and Niilo Saranummi (IFMBE).

1987–88, September – IUPESM supports the 1st International College on Medical Physics (also for medical engineers) focussed on professional development in LMI countries, hosted by ICTP, Trieste, Italy – with Co-organisers Luciano Berthocci, Anna Benini. Now the College is regular with many students and contributors (to mention the longest serving of these: Perry Sprawls, Slavik Tabakov, Franco Milano, Mario De Denaro, Paola Bregant, Renato Padovani);

1988, August – 4th IUPESM World Congress organised in San Antonio, Texas, USA – Co-Presidents: Gary Fullerton (IOMP), Robert Nerem, and David Kopp (IFMBE). Establishment of the IUPESM Award of Merit—the awardees from 1988 to 2018 are listed in ANNEX 1;

1991, July – 5th IUPESM World Congress organised in Kyoto, Japan—Co-Presidents: Hiroshi Abe (IOMP) and Fumihiko Kajiya (IFMBE);

1994, August – 6th IUPESM World Congress organised in Rio de Janeiro, Brazil—Co-Presidents: Carlos Eduardo de Almeida (IOMP) and Ronney Panerai (IFMBE);

1997, August – 7th IUPESM World Congress organised in Nice, France—Co-Presidents: Pierre Aletti (IOMP), Jean Pierre Morucci (IFMBE), and Bernard Rigaud (IFMBE);

1997–1998 – Dialogue begun for a full membership of IUPESM in ICSU (main contributors: Keith Boddy, Fumihiko Kajiya, Niilo Saranummi, Gary Fullerton, Dov Jaron);

1999, September – ICSU accepts IUPESM as a full member at its meeting in Cairo, Egypt [4];

2000 – Both IUPESM Constituent members mark the ICSU recognition by approving its main Scientific and Professional Awards: IOMP – the “Marie Curie Award” and “Harold Johns Medal”; IFMBE – the “Otto Schmitt Award” and later “Vladimir Zworykin Award” (contributors: all members of the Awards and Honours Committees).

2000, August – 8th IUPESM World Congress organised in Chicago, USA—Co-Presidents: William Hendee (IOMP) and Al Potvin (IFMBE). First IOMP and IFMBE Awards presented to distinguished colleagues.

2003, August – 9th IUPESM World Congress organised in Sydney, Australia—Co-Presidents: Barry Allen (IOMP) and Nigel Lovell (IFMBE);

2004–2010 – Discussions begun with ILO (International Labour Organisation, Geneva) for including the professional occupations medical physicist and biomedical engineer in the International Standard Classification of Occupations, ISCO—(main contributors: Azam Niroomand Rad, Peter Smith, Fridtjof Nuesslin, Colin Orton, Heikki Terio, Slavik Tabakov);

2006 – 10th IUPESM World Congress organised in Seoul, South Korea—Co-Presidents: Kim Sung-Kyu (IFMBE) and Tae-Suk Suh (IOMP);

2007 – Discussions begun for establishing of an IUPESM Journal “Health and Technology” – Founding Editor Joachim Nagel, further Co-Editors in Chief: Lodewijk Bos, Luis Kun, Magdalena Stoeva, Kang Ping Lin; Chairs Union Journal Committee: Per Ask, Ratko Magjarevic [5].

2008—ICSU elected one of the IUPESM representatives (Dov Jaron), as a member of its Executive Committee;

2009, August – 11th IUPESM World Congress organised in Munich, Germany—Co-Presidents: Wolfgang Schlegel (IOMP) and Olaf Dossel (IFMBE);

2010—IUPESM Journal “Health and Technology” approved by Springer, prepares its first issue (published in 2011).

2011—International Labour Organization (ILO) officially recognizes medical physicist and biomedical engineer as professional occupations and includes in the International Standard Classification of Occupations (ISCO): medical physicist under category (2111) and biomedical engineer under (2149) [6];

2011 – IUPESM Education and Training Committee publishes the book “Medical Physics and Engineering Education and Training” [7];

2012 – To mark the IUPESM achievement (ILO recognition) IOMP announces the establishment of its professional day: International Day of Medical Physics, 7 November, the Birthday of Maria Sklodowska-Curie (main contributors: Simone Renha, Fridtjof Nuesslin, John Damilakis). Respectively, in 2016, IFMBE

announced the establishment of the Global Clinical Engineers Day—21 October (main contributors: Yadin David, Herbert Voigt, James Goh);

2012 – 12th IUPESM World Congress organised in Beijing, PR China—Co-Presidents: Yimin Hu (IOMP), Depei Liu, Yubo Fan (IFMBE), also Raymond Wu (IOMP);

2012 – IUPESM forms Health and Technology Task Group (main contributors: Joachim Nagel, Barry Allen, Yadin David, Caridad Borrás). HTTG published in 2017 the book “Defining the Medical Imaging Requirements for a Rural Health Center” (Ed. Caridad Borrás) [8];

2013 – IUPESM supports new Journal of IOMP focussed on professional and educational topics “Medical Physics International” (including also medical engineering education topics), Founding Co-Editors in Chief: Slavik Tabakov and Perry Sprawls, Technical Editor: Magdalena Stoeva [9];

2014—IUPESM forms Women in Medical Physics and Biomedical Engineering Task Group (main contributors: Monique Frize, Eva Bezak, Gilda Barabino);

2015 – 13th IUPESM World Congress organised in Toronto, Canada—Co-Presidents: David Jaffray (IOMP) and Tony Easty (IFMBE);

2016–17 – IUPESM starts annual physical Administrative Council meeting at the IFMBE and IOMP international conferences (organised by Kin Yin Cheung, James Goh, Slavik Tabakov, Stelios Christofides, Anchali Krisanachinda);

2018 – 14th IUPESM World Congress organised in Prague, Czech Rep.—Co-Presidents: Jaromír Cmíral (IFMBE), Libor Judas (IOMP) also Lenka Lhotska (IFMBE). Same year the IUPESM Secretary General Leandro Pecchia leads talks with the European Parliament for inclusion of specific projects on Biomedical Engineering and Medical Physics;

2018 – Founding General Assembly of the International Science Council (ISC), following the merger of ICSU and ISSC, Paris, France—IUPESM represented by James Goh as a voting delegate.

2019 – IUPESM initiated joint Workshops for medical physicists and engineers (main contributors: James Goh, Kang Ping Lin, Leandro Pecchia and Magdalena Stoeva);

2020 – To mark its 40th Anniversary IUPESM launches its Fellowship Scheme—FIUPESM (main contributors: Slavik Tabakov, James Goh, Kin Yin Cheung, Simone Renha, Ratko Magjarevic) [10];

2021—15th IUPESM World Congress (Singapore) postponed to 2022 due to the COVID-19 pandemic;

2021 – IUPESM amends the Statutes and Bylaws, including formation of a Company, through its first e-ballot (main contributors: Slavik Tabakov, James Goh, Kin Yin Cheung, Leandro Pecchia, Stephen Keevil, Colin Orton);

2022 – IUPESM moves towards incorporation of the Organisation as a Company limited by guarantee;

2022 – 15th IUPESM World Congress organised in Singapore—Co-Presidents: Lip Teck Chew (IOMP), Chwee Teck Lim (IFMBE), also James Lee Cheow Lei and Hwa Liang Leo – the first hybrid (in person and virtual) IUPESM Congress [11].

3 IUPESM main contributors

Since the formation of IUPESM in 1980, over 500 medical physicists and biomedical engineers have been elected and appointed to serve the various IUPESM Committees. All these have contributed voluntarily to the aims of the Union. In year 2020, 58 elected colleagues from 26 countries have been awarded with Fellowship (FIUPESM), unfortunately 17 of those are no longer with us. The FIUPESM was to honour the international leaders who have made outstanding contributions to the medical physics and biomedical engineering professions as well as to IUPESM over the 40-year period 1980–2020. The Fellowships were presented at a special Virtual Inaugural Fellowship Ceremony held on 20th November 2020.

The biographies of the inaugural Fellows of IUPESM, who are the main IUPESM contributors over the period 1980–2020, are listed chronologically in the ANNEX 2 (together with their main achievements and photos, as publicised at the FIUPESM Award ceremony in Nov 2020 and further official announcements of the IUPESM Fellowships).

4 Conclusion

The global recognition of the medical physics and biomedical engineering professions could only be achieved through the formation of the Union—the IUPESM. Over the last 42 years, many of our colleagues have contributed significantly to the service, activities and development of IUPESM. Starting in 1980 with 20,000 members from 54 countries, now the Union represents in the ISC and the ILO an estimated total global workforce of about 150,000 professionals from 98 countries. IUPESM acknowledges gratefully all colleagues who served the Organisation as Offices, Chairs and Committee members over these 42 years. IUPESM proudly continues to contribute to the advancement of physical and engineering science in medicine for the benefit and wellbeing of humanity.

Annex 1

IUPESM Award of Merit Recipients (1988–2018):

- 1988 John Mallard (UK).
 1991 John A. Hopps (Canada).
 1994 Rune Wallstam (Sweden).
 1997 Jack Cunningham (Canada) and Robert Plonsey (USA).
 2000 Keith Boddy (UK) and Masao Saito (Japan).
 2003 Colin Orton (USA) and Robert Nerem (USA).
 2006 Pedro Andreo (Spain/Sweden) and Dov Jaron (USA).
 2009 Gary Fullerton (USA) and William Bonfield (UK).
 2012 Caridad Borrás (USA) and Joachim Nagel (Germany).
 2015 Peter Smith (UK) and Fumihiko Kajiya (Japan).
 2018 Eliseo Vano (Spain) and Jos A. Spaan (Netherlands).

Annex 2

Bios of inaugural Fellows of IUPESM—the main IUPESM contributors in the period 1980–2020:

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