

# **International Federation for Medical and Biological Engineering**



## **Awards Committee Report 2017**

# Awards Committee Report

## Tampere, Finland

### EMBEC 2017 & Nordic Baltic Conference 2017



A. The members of the Awards Committee for 2015 to 2018 are listed below:

Shankar Krishnan, USA	Chair
Ratko Magjarevic, Croatia	Co-Chair
Akos Jobbagy, Hungary	Member
Depei Liu, China	Member
Kim Dremstrup, Denmark	Member
Makoto Kikuchi, Japan	Member
Bin He, USA	Member
Nigel Lovell, Australia	Member
Martha Zequera Diaz, Colombia	Member
Joachim Nagel, Germany	Member
James C. H. Goh, Singapore	Past-Chair

B. The awards that are presently given out by IFMBE are listed in the following section.

The list of IFMBE Awards is in the process of being updated.

The refinement needed for the criteria of a few awards, such as IFMBE-WHO Innovative Health Tech Awards, are in process.

Proposal for new awards, if any, will be considered, reviewed, and corresponding recommendations will be sent to the Administrative Council for approval.

It is recommended that Award recipients should consider submitting their award winning research work to IFMBE's MBEC Journal for possible publications. Suitable recommendations will be sought from the IFMBE Federation Journal Committee and the Editor-in-Chief of MBEC.

## Awards List

### 1. The Otto Schmitt Award

The Award is given to a Biomedical Engineer for exceptional leadership and seminal contributions to the advancement of medical and biological engineering.

Otto Herbert Schmitt was a very influential biomedical engineer and biophysicist who coined the term 'biomimetics'. Schmitt was a talented inventor right from his high school years. He helped his older brother with electrical instruments and laboratory work in the Zoology Department at Washington University. The young boy's work impressed several faculty members and he was admitted into the university before he had even completed High School. In college he displayed great interest and skill in physics, electronics and mathematics and was into research from his undergraduate years. Schmitt made his first publication in his first year of college and earned his Bachelor's degree in Zoology and Physics in 1934. He started graduate research at the same university and earned his PhD with Majors in Physics and Zoology and a Minor in Mathematics. After that he did a Post-doc from University College in London. In London, Schmitt worked on a novel circuitry, which made such an impact on electronics that it is referred to as the 'Schmitt Trigger'. In 1939, Schmitt got a dual appointment at the University of Minnesota in the Departments of Zoology and Physics. With the outbreak of the World War II, Schmitt became an official investigator for the National Defense Research Committee, which provided funding for top secret military science research. However, after the war, Schmitt returned to academia, doing research and advising graduate students at the University of Minnesota, where he became a full professor and professor emeritus. Schmitt is famous for his research on nerve impulse formation and propagation. He also made many influential applications in the biomedical field, such as applying his three dimensional oscilloscope display to electrocardiographs. He helped to found many professional societies for biophysics, like the Biomedical Engineering Society, the Biophysical Society, the Association for Advancement of Medical Instrumentation, the International Federation of Medical and Biological Engineering and the International Union of Pure and Applied Biophysics. He also coined the term 'biomimetics' – one of the largest areas of study within biomedical engineering.

Past Awardee (WC 2015): Prof. Karin Wårdell, Sweden

Next Awardee (WC 2018)

### 2. The Vladimir K. Zworykin Award

The Award is given to a Biomedical Engineer for outstanding and innovative research contributions in the field of medical and biological engineering.

Zworykin was born in Russia on 30 July 1889. He was interested in television his entire career. As a young engineering student, he worked for physicist Boris Rosing who was trying to send pictures through the air. In 1919, following the Russian Revolution, Zworykin moved to the United States. He worked at Westinghouse Electric Corporation in Pittsburgh. In 1929, when Zworykin didn't get the support or encouragement he needed to build electronic televisions, he moved to RCA. With the strong support of RCA's head David Sarnoff, another Russian immigrant, Zworykin continued developing electronic television. His all-electronic television system was introduced to the public at the 1939 New York World's Fair. Zworykin's and RCA's work was directly challenged by the patent claims of Philo T. Farnsworth who also worked on electronic television. Farnsworth won a major patent suit against RCA in 1939 and Zworykin's designs for electronic TV would not be considered the first. Despite the legal battle, Zworykin's contributions to television were great. And while some may have called him Father of Television, Zworykin always said that television was the creation of hundreds of inventors and researchers. Zworykin's own contributions were recognized by the AIEE who awarded Zworykin its Edison Medal in 1952 'For outstanding contributions to concept and design of electronic components and systems.' In 1950 he was awarded the prestigious Medal of Honor by the Institute of Radio Engineers (IRE) "For his outstanding contributions to the concept and development of electronic apparatus basic to modern television, and his scientific achievements that led to fundamental advances in the application of electronics to communications, to industry and to national security." He died on 29 July 1982 in Princeton, New Jersey.

Past Awardee (WC 2015): Prof. Chwee Teck Lim, Singapore

Next Awardee (WC2018)

### **3. John A. Hopps Distinguished Service Award**

The inaugural Award is given to a Biomedical Engineer who has made significant contributions to the professional, technical, promotional, educational and/or scientific activities of the IFMBE.

Mr. John Hopps is believed to be the inventor of the pacemaker. He was born in Winnipeg in 1919. At the age of 21 he obtained his degree in electrical engineering from the University of Manitoba. At the National Research Council in Ottawa, Ontario he devoted his career to developing cardiovascular instrumentation. At the University of Toronto his colleague Dr. Wilfred Bigelow observed during a hypothermia experiment with a lab animal that the heart stopped when muscular contraction failed at a low temperature, when he prodded the left ventricle he noticed the heartbeat. Dr. Bigelow concluded that when the heart was artificially stimulated it behaved in a normal fashion and when he ceased the stimulation the heart also stopped. This helped Mr. Hopps in his development of the pacemaker. Also by observing Dr. Sweet, Mr. Wiggers and Dr. Kouwenhoven while doing experiments on electrical shocks helped John in his creation. When Hopps returned to his NRC laboratory to produce a pacemaker that would send single electrical pulses at appropriate rates to control a heart at normal or low temperatures. His instrument combined a defibrillator with a pacemaker to shock the heart in uncoordinated contractions back to a normal rhythm. In the early 1950s the 1st pacemaker was built, at this time it was a very large device and therefore could not be implanted in the chest, this led to continuous research on energy requirements and optimal pulse forms. In mid 50s Hopps group built prototypes and supplied a number of them to at least 10 locations in the States. The first pacemaker was implanted in a human in 1958. Hopps got his degree of doctor in science in 1976 by the University of Manitoba. 30 years after his invention in 1985 it was implanted in his own chest. In 1986 he was honoured with the Distinguished Scientist Award. Also in 1985 he received the IEEE Region 7 award and the ACL McNaughton medal for outstanding contribution of electrical and electronics engineering. In June of 1986 he was awarded with the Order of Canada for his contributions to the sciences in Canada. In 1987 He was accorded the Biomedical Engineering Leadership Award in the States. Hopps died on November 24th 1998. His wife Eleanor predeceased Hopps (also known as Jack). He left behind a daughter and two sons.

Past Awardee (WC 2015): Prof. Robert Nerem, USA

Next Awardee (WC 2018)

### **4. Honorary Life Members**

The title of Honorary Life Member is bestowed on individuals who have rendered exceptional service to the Federation. Honorary Life members can be nominated at any time. Election for Honorary Members shall be conducted by members of the General Assembly at least 3 months before the IUPESM World Congress.

Past Awardees (WC 2015): Prof. Makoto Kikuchi, Prof. Akos Jobbagy, Prof. Fernando Infantosi, Prof. Joseph Barbenel, Prof. Laura Roa, Prof. Miguel Cadena, Prof. Gerhard M. Artmann, Prof. De-Pei Liu, Prof. Monique Frize, Prof. Per Ask

Next Awardees (WC 2018)

### **5. Young Investigators Award**

The IFMBE Young Investigator Competition (YIC) is organized annually to recognize excellence in conference contributions whose primary authors are young investigators (persons under the age of 35).

### **6. IUPESM Award of Merit**

The Award is given to an outstanding Biomedical Engineer who has participated meritoriously in national & international organizations, and has significantly influenced the development of the professions of Biomedical Engineering.

Past Awardee (WC 2015): Prof. Fumihiko Kajiyama, Japan

Next Awardee (WC 2018)

## **7. The IFMBE-IAMBE Early Career Award**

The IFMBE/IAMBE Early Career Award (ECA) highlights the commitment of the IFMBE and IAMBE to support and encourage promising young researchers at an early stage in their career. The Award consists of a certificate and a monetary award. Awards are given at each IUPESM World Congress to one individual from each of the following four geographic regions: North America, Central & South America, Europe & Africa, Asian-Pacific. Particular emphasis is given to countries with a low economic background, and to geographical diversity. The IFMBE/IAMBE Awards Committee members are: Peter Niederer (Chair), Laura Roa Romero, Zhi-Pei Liang, James Goh, and Dov Jaron.

Award Winners:

Past Awardee (WC 2015): Dr. Carmen Chung-Yan Poon, Hong Kong (Asia Pacific)

Past Awardee (WC 2015): Dr. Liesbet Laura Jo Geris, Belgium (Europe & Africa)

Past Awardee (WC 2015): Dr. Aysegul Gunduz, USA (North America)

Next Awardees (WC 2018)

## **8. James Edward Zimmerman Prize**

The Award is presented for exceptional contributions to the development of new methods in biomedical engineering. The primary criterion for the JZP is a significant contribution to novel SQUID-based and new generation of sensor developments, and applications in the field of biomagnetism. The award is presented biannually either at the BIOMAG Conferences or during the Biomagnetism Session of the World Congress on Medical Physics and Biomedical Engineering with a monetary award of 1,000 EUR. The JZP Committee of the particular biannual meeting will determine specific application/nomination criteria and application submission details. The JZP winner is expected to give an oral presentation of the awarded research during a plenary session. Every sixth year, the JZP winner will be invited to present a plenary talk of its award winning research at the World Congress on Medical Physics and Biomedical Engineering (World Congress).

The JZP Committee shall consist of the members of the Award Committee of the particular biannual meeting, the Chair of IAB of the BIOMAG conferences and the Chair of the IFMBE Awards Committee. The JZP Committee of the particular biannual meeting selects one candidate at least three months prior to the BIOMAG Conference or World Congress and informs the JZP winner. The JZP winner commits himself to give a plenary presentation on his/her research results at the particular Conference and/or Congress. The IFMBE and the IAB will decide on the venue for Award presentation by the time the winner is announced. If it would be possible for the winner to present his/her research at both events (WC and BIOMAG) this will be cordially supported in order to promote research in the field of biomagnetism and the IFMBE would contribute to travel expenses and ask the WC organizers to waive the registration fee for the World Congress.

James Edward Zimmerman (February 19, 1923 – August 4, 1999) was born in Lantry, South Dakota. He was a coinventor of the radio-frequency superconducting quantum interference device (SQUID) and he is credited with coining the term. In addition, in the late 70's and early 80's, he also gave a major contribution to the development of low-power closed-cycle Stirling refrigerators, to reach temperatures in the range 4K - 8K with the purpose of cooling SQUID devices and small-scale superconducting electronics without resorting to liquid helium dewar vessels. A major achievement was the use of plastic parts made in the laboratory, which would be assembled in a totally non-magnetic cryocooler (refrigerator), in order not to interfere with highly sensitive SQUID's. Later, he was also involved in the development of pulse-tube cryocoolers.

Past Awardee (BIOMAG 2014): Prof. Myriam Pannetier-Lecoeur, France

Past Awardee (BIOMAG 2016): Prof. Svenja Knape, USA

Next Awardee (WC 2018)

## **9. The Women in BME Committee's Laura Bassi Award**

The Laura Bassi Award is presented by IFMBE every three years at the IUPESM World Congress. The Laura Bassi award will be given to a senior female biomedical engineer for outstanding research contributions in the field of medical and biological engineering. The criteria for nominations include innovation and outstanding research contributions to medical and biological engineering. The awardee will be required to make a scientific presentation in the area of the awardee's expertise at the World Congress.

Laura Maria Caterina Bassi (1711-1778) was a prodigy. She was interested in science and philosophy at the tender age of five. Laura was tutored by a cousin until age 13, then by a professor at University of Bologna (Dr. Tacconi) to learn the more advanced science and mathematics. She disputed on science and philosophy subjects in her home with several members of the Academy of Science of Bologna and some eminent men such as Cardinal Lambertini (the future Pope Benedict XIV). On April 17, 1732, Laura defended 49 theses at the University of Bologna, for which she was awarded a doctorate in philosophy on May 12 in the same year. Several of the theses were on physics and other science topics. In March, 1732, she had been invited to become a member of the Academy of Science of Bologna. On June 27, 1732, Laura defended another 12 theses; the plan was to encourage the university to award a Lectureship to Laura Bassi. Laura was appointed as a Lecturer on October 29, 1732, the day she turned 21 years old, with a salary equivalent to that of her male colleagues. She appears to have been the first woman professor in science in the world. Laura was drawn by the philosophy of Newton and introduced this and calculus in her courses, while most men involved in science at the time still focused on Descartes and Galen. Laura Bassi made the transition from the old science to the new and introduced this to Italy. She taught classes on experimental physics for 30 years. This complemented well the theoretical courses taught by the University. Laura Bassi presented original research at the Academy every year between 1745 and 1778, the year she died. Laura was awarded the Chair in Physics in 1776, two years before her death. Although most of the awards bestowed upon her were meant to be honorary, Laura's strategies succeeded to turn all into real positions.

Past Awardee (WC 2015): Prof. Alison Noble, United Kingdom

Next Awardee (WC 2018)

#### **10. The IFMBE-WHO Innovative HealthTech Awards**

The World Health Organization (WHO) and IFMBE with support of the IFMBE Clinical Engineering Division (CED) made a joint effort to identify innovative health technologies designed and developed by students, researchers and inventors. The proposal is to establish 4 awards that would promote innovative health technologies that address global health concerns that are likely to be designed, developed and affordable for low-resource settings. The intent is to discover promising innovations that can be used to help people in countries that cannot afford to purchase and maintain expensive technologies. The IFMBE and WHO are offering the following 4 prizes: Best Medical Device Innovation, Best Digital Health Innovation, Best Healthcare Methodology Innovation and Best Clinical Engineering Innovation. Besides receipt of awards, the innovation will be included in the WHO compendium series.