



**SPOTLIGHT ON
EUROPE**

IFMBE NEWS

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CONTENT

IFMBE News
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EDITORIAL ————— 03

- Open a window to BME in Europe Kang-Ping LIN

IFMBE EXPRESS ————— 04

- From the President Ratko Magjarevic
- News from the Council of Societies of IFMBE
- EUCOMED and IFMBE Collaboration: Success of the Industry Working Group
- Free access to Medical & Biological Engineering & Computing (MBEC) papers
- Promotion of young scientists DGBMT – the 2014 award of the “Family Klee Foundation“
- Jan Maria WOJCICKI Obituary

REPORT FROM IFMBE: Affiliated Societies ——— 15

- Report on MEDICON 2013
- EAMBES position paper for Horizon 2020 research in technologies for health and medicine
- Development of BME in Spain
- Medical engineering in Poland
- 12th Belgian National Day on Biomedical Engineering

FEATURE COLUMN: BME in Europe ————— 36

- Stories from women in Biomedical Engineering in Europe
 - My short story of a noble profession by Loredana G.Marcu
 - Article by Lena-Kajsa Sidén
 - Additional article by WiSE
 - A new book by Monique Frize

COMING EVENT ————— 43

- MEDITECH 2014 (June 5-7, 2014, Cluj-Napoca)
- MBEC 2014 (September 7-11, 2014, Dubrovnik)
- APCMBE 2014 (October 9-12, 2014, Tainan)
- CLAB 2014 (October 29-31, 2014, Argentina)
- World Congress 2015 (June 7-12 2015, Toronto)



EDITORIAL

Open a window to BME in Europe



Kang Ping, Lin
NEWS EDITOR

Europe is the most economically developed continent in the world. In this region, BME development has a longer history, and BME activities have active atmosphere and good traditions.

We would like to open a window for each member to feel the Spain's hotness, the Belgium's attitude, the Poland's history of BME, and the European women's stories in BME. The all have been collected in this issue for you.

In additions, we got more good news from the IFMBE. The IFMBE Industry Working Group reported its success of collaboration with the European medical technology industry association. The IFMBE CoS reported its first meeting in Spain. Also, the IFMBE released free access to Medical & Biological Engineering & Computing (MBEC) papers for all its members.

This year, the regional but also traditional Mediterranean Conference on BME was held in Spain. The IFMBE Administrative Council, Council of Societies, and many committees had their work meetings in conjunction with the Conference. Many IFMBE European affiliations developed their activities in 2013, and EAMBES shared its position paper for Horizon 2020 research in technologies for health and medicine. Thanks to Prof. Laura M. Roa, Prof. Marc Nyssen, Dr. Ewa Zalewska and Dr. Andrei Linnenbank, we got splendid reports and wonderful photos for these events.

Besides, in the Feature Column, we sincerely appreciate IFMBE WiMBE committee, Dr. Monique Fruiz provided us chances to know about European women in BME by several short stories. We also introduced a new book on woman professor in Europe.

The 2014 is the "Horse" year according to Lunar Calendar. Here I would like to wish you a Happy Chinese New Year and the best everything.





From the President



Ratko Magjarević
President, IFMBE

On behalf of the Officers and the Administrative Council of the IFMBE, I wish you all, members of the IFMBE affiliated biomedical Societies and of the larger biomedical engineering community, a very happy New Year and a lot of success in your personal life and in your research and professional activities!

I am glad to be able to inform you that since the latest issue of the News, the reform of the management of the Federation has been completed by the election of the IFMBE Regional representatives to the Administrative Council (AC). I would like to congratulate the new AC members, Birgit Glasmacher, Monique Frieze, Yubo Fan and Eric Laciár Leber on their election and wish them all a warm welcome to the AC.



Prof. Birgit Glasmacher is Professor for Multiphase Processes & Spokesman Centre for Biomedical Engineering, Faculty of Mechanical Engineering, Leibniz - University of

Hannover, Germany, where she is the Director of the Institute for Multiphase Processes. Birgit is the President of the European Alliance for Medical and Biological Engineering and Science and also a member of numerous international and national scientific associations such as International Federation for Artificial Organs (Bord Member 2010-2015), American Society for Artificial Internal Organs (ASAIO), European Society for Artificial Organs (ESAO, Secretary General 2008-2011), International Society for Cryobiology (SFC; Secretary General 2007-2009), German Society for Biomaterials (DGBM), German Society for Biomedical Engineering (DGBMT) & VDE; Society for Heart Valve Disease (SHVD), ProcessNet/DECHEMA/GVC; The Association of German Engineers (VDI), Society for Low Temperature Biology (SLTB), German Society of Refrigeration and Air Conditioning (DKV), Tissue Engineering Regenerative Medicine International Society (TERMIS); International Faculty for Artificial Organs (INFA). She was actively involved in organization of international meetings and she is co-chairing the 6th European IFMBE Conference to be held this September in Dubrovnik. Birgit was elected by the representatives of the European and African affiliates to the IFMBE and shall act as representative of the IFMBE regions Europe and Africa.



IFMBE EXPRESS



Prof. Monique Frize is Professor in Systems and Computer Engineering, Carleton University, with a joint appointment in School of Information Technology and Engineering, University of Ottawa. Monique is well known to the IFMBE members as the Chair of the IFMBE Women in Biomedical Engineering Committee. She has organized events discussing the position of women in BME and in engineering generally on numerous conferences, and her work has already been recognized by Honorary Membership in Women in Science & Engineering (W.I.S.E.) and by Advocacy Award by Women in Trades and Technology (WITT). In the organization of the World Congress on Medical Physics and Biomedical Engineering, to be held in Toronto, Canada next year, Monique is deeply involved in the Scientific Committee and in the Program Committee. Monique is representative of the Northern American societies affiliated to the IFMBE.



Prof. Yubo Fan is Professor and Dean of the School of Biological Science and Medical Engineering, Beihang University in China. He is also the President of the Chinese Biomedical Engineering Society. Prof. Fan, as the president of the CSBME, made great efforts in organizing international and national Confer-

ences, Symposium, and Forums in Biomedical Engineering, strongly promoting the development of Biomedical Engineering in China, especially in development of training and educational programs. In 2012, Yubo was one of the hosts of the World Congress on Medical Physics and Biomedical Engineering in Beijing. His efforts contributed to the great success of the Congress. Prof. Fan is the representative of the affiliated BME societies from the Asia Pacific region.

Eric Laciár Leber is Professor in the Departamento de Electronica y Automatica of the Universidad Nacional de San Juan, Argentina and a Career Investigator of Consejo Nacional de Investigaciones Cientificas y Tecnicas(CONICET). His research areas include digital processing and analysis of biomedical signals in cardiorespiratory and brain diseases. He is currently the Secretary General of CORAL, the Latin American regional BME association of BME Societies and IEEE EMBS Chapters. Eric is representing in the AC the Latin American IFMBE affiliates.

In November 2013, the World Health Organization (WHO) organized the 2nd Global Forum on Medical Devices in Geneva, Switzerland. IFMBE representatives were invited to actively participate in the Forum (for more informa-



IFMBE EXPRESS

tion, please visit http://www.who.int/medical_devices/2nd_gfmd/en/index1.html). The 2nd Global Forum provided the global public health community with opportunities for information exchange and collaboration aiming to increase access to high-quality, safe, and appropriate priority medical devices. The Universal Health Coverage Strategy of the WHO intended to ensure the continuum of care ranging from screening to diagnosis, treatment and rehabilitation. At the conference, there was representation from end users and stakeholders: academia, international organizations, indus-



Medical devices Forum Photo Geneva 2013

try, and NGOs. After the Forum, the WHO reported 151 oral presentations, 116 posters, 36 workshops and 568 attendees from 104 Member States. It is important to stress that since the adoption of the first resolution on health technologies in May 2007 by the World Health Assembly (WHA 60.29), the framework for an unprecedented focus on health technologies was set. The 1st Global Forum on Medical Devices held in September 2010, raised awareness on importance of medical devices for safe and effective delivery of health care.

Throughout the Forum, in presentations and discussions, biomedical engineers were considered and addressed as a part of the world health force. However, it has to be noted that the status of biomedical and clinical engineers and medical physicists is not equal within the health care service in different countries and the non-governmental organizations (NGOs) in formal relations with the WHO, such as IFMBE, have to continue pointing out the role of these professions in providing safe and effective health care.

I would like to invite you to have a close look at the list of the IFMBE co-sponsored conferences and other IFMBE endorsed scientific events within this issue of the News and to decide on which of those conferences you will take part. Next year, the IFMBE is co-sponsoring the 6th European IFMBE Conference to be held in Dubrovnik, Croatia, in September, the 9th International Conference on Cell and Stem Cell Engineering 2014 to be held in Aachen, Germany also in September. In October 2014 the IFMBE is co-sponsoring the 9th Asian Pacific Conference on Medical and Biological Engineering in Tainan, the 16th Nordic-Baltic Conference on Biomedical Engineering 2014 in Goteborg, Sweden and the VI Congreso Latinoamericano de Ingeniería Biomédica to be held in Parana, Entre Rios, Argentina.

Looking forward to seeing you!



News from the Council of Societies of IFMBE

Election results

At the meeting of the Council of Societies (CoS) in Seville, Spain, the results of the elections for Regional Group Representatives (RG-R) were announced.

Yobo Fan was elected to represent the Asian Pacific region, Birgit Glasmacher the European-African region, Eric Laciár Leber will represent the Latin American region, and Monique Frize the North-American region. By their election they will now also be member of the Administrative Council (AC) of the IFMBE. With these results, the executive board of the CoS is now fully operational. Apart from the four Regional Group Representatives, the executive board also includes André Linnenbank (Chair of the CoS), Mario Forjes Secca (Past-president of the Societies Committee), Ratko Magjarevic (President IFMBE, ex officio), and Krishnan Shankar (SG IFMBE, ex officio).

Objectives of the CoS and plans for the future

One of the main reasons for creating the four regions was that the Regional Group Representative could bring points from the societies in the whole region to the AC and the CoS, and from these back to the region. Within the CoS, we will discuss issues that are regional but play in more than one region.

The main focus of the CoS will be on issues that directly have an impact on societies and individual members, whereas the focus of the AC is more on the global scale and the interaction outside the federation (WHO, ICSU,...). How this will work out in practice is the interesting experiment we will be doing the next years.

Important issues that will be on the agenda of the CoS include: how does the legislation in biomedical equipment differs between countries and how can we influence that? How can we improve access to the literature for non-native English speakers, both to read it and to get published (and vice versa, how to get access to non-english literature)? All regions (apart perhaps from North-America) include not so wealthy countries and locations that are difficult to access, so how does that influence the specifications for biomedical equipment? Other more generic questions are: "what is the role of Biomedical Engineers in health care in the various countries" and "do we all mean the same with the label Biomedical Engineering".

Upcoming Conferences by Region

Asian Pacific Region

- APCBME 2014 (October 9-12 Tainan, Taiwan)



IFMBE EXPRESS

European African Region

- European IFMBE Conference 2014 (7-11 september, Dubrovnik, Croatia)
- NBC 2014 (October 1 Goteborg, Sweden)
- Medicon 2016 (Cyprus)
- NBC 2017 (possibly Finland)

Latin American Region

- CLAIB 2014 (October 28-30, Parana, Argentina)
- CLAIB 2016 (Bucaramanga, Colombia)

North American Region

- WC Toronto 2015
- EMBS 2014 (Chicago, August 27-31)
- EMBS 2015 (Milano, August 30- sept 6)
- 8th international conference on ethics in biology, engineering & medicine (Brooklyn, April 24-26 2015)
- CMBEC 2014 (Vancouver, May 20-23).

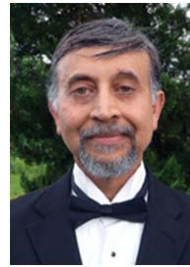
Next (regional) Council of Societies meeting

All members of the Council of Societies and other delegates are cordially invited to join the next Council meeting at the Asian Pacific meeting in Tainan.

Various short announcements

Only a few societies give members direct access to the Springer publications from our federation (MBEC, Health Care Technology). It is important for the accessibility of the MBEC that more societies use this opportunity if members do not have access in another way. This will also increase visibility of the papers

that are published in the journal.



Nitish Thakor is our new editor in chief of the MBEC.

At the World Congress in Toronto a new President Elect needs to be elected as well as new members of the AC and

perhaps also other officers. There are also a number of awards to be given. All Societies are urged to propose candidates and nominees.

The 2014 ACCE Award Banquet is on Monday, February 24, 2014 at the HIMSS/ACCE meeting in Orlando or Sunday, June 1, 2014 at the AAMI/ACCE meeting in Philadelphia. Please take time to nominate worthy colleagues today or contact students to submit their papers. Just fill out the Nomination form and attach to an email to advocacychair@accenet.org by January 17, 2014. (See website at: <http://www.accenet.org>)





EUCOMED and IFMBE Collaboration – Success of the Industry Working Group

Atlas of Knowledge launched to facilitate collaboration among academic institutions and the medtech industry

Eucomed and the International Federation for Medical and Biological Engineering are launching the joint project “Atlas of Knowledge”. Interactive cooperation with the medical device industry is a crucial factor of growth in Biomedical Engineering research and development across the globe.

Medical device manufacturing and marketing has become a global business, whereby small and medium sized companies (SMEs) belong to the leading institutions worldwide with respect to the MedTech field.

Due to financial and organisational limitations, SME companies are not always prepared to use state-of-the-art technologies and assessment techniques for medical devices. A technical, technological and intellectual property provision of academic institutions would support a timely and cost-effective development and manufacturing of medical devices and thus, increase the competitiveness of SME companies.

To foster such cooperation between academic

institutions and the manufacturing medical device industry, the IFMBE (International Federation of Medical and Biological Engineering) together with Eucomed will embark on a project entitled the “Atlas of Knowledge” in the field of medical devices.

The purpose of this Atlas is to collect and summarize the scientific and research potential of the IFMBE members and member institutions related to research expertises, accessibility of the facilities and equipment as well as realization of the engineering education in terms of efforts to collaborate with the medical device industry/corporation.

List of expertise includes:

- Active implants
- Artificial organs
- Biomaterials
- Biomechanics
- Cells and tissue engineering
- Cardiovascular engineering
- Diagnostic systems and biosensors
- Flow and rheology
- Imaging modalities
- Information and Communication Technology
- in Medicine
- Modelling and control of physiological and biological systems



IFMBE EXPRESS

- Nanotechnology in biology and medicine
- Neural engineering
- Patients safety
- Radiation therapy systems
- Rehabilitation engineering
- Surgery and intervention
- Telemedicine
- Testing and quality control of medical devices
- Therapeutic systems

The Atlas would bring together academic inventors and corporate R&D-scientists for the benefit of both parties. Due to the large number of IFMBE members – about 120.000 worldwide – IFMBE intends to start gathering data first Central Europe that is from Germany, Austria, Sweden and Poland as a model and then expand the project globally. Data is currently being collected which will hopefully allow for a launch of the electronic platform by the end of this year.

For more information, please contact Jan Wojcicki at Jan.Wojcicki@ibib.waw.pl

Who we are

IFMBE

The International Federation for Medical and Biological Engineering (IFMBE) was established in 1959 to provide medical and biological engineering with a vehicle for international

collaboration in research and practice of the profession. The Federation has a long history of encouraging and promoting international cooperation and collaboration in the use of science and engineering for improving health and quality of life.

The IFMBE is an organization with membership of national and transnational societies and an International Academy. At present there are 55 national members and 5 transnational members representing a total membership in excess of 120 000 worldwide. For more information visit www.ifmbe.org

Eucomed

Eucomed is the European medical technology industry association. Its mission is to make modern, innovative and reliable medical technology available to more people. Eucomed represents directly and indirectly 25,000 designers, manufacturers and suppliers of medical technology used in the diagnosis, prevention, treatment and amelioration of disease and disability. Small and medium sized companies make up more than 95% of this sector. The market size is estimated at roughly € 100 billion while around 8% of sales revenue is ploughed back into research and development. The industry employs more than 575,000 highly skilled workers. For more information visit www.eucomed.org.



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Free access to Medical & Biological Engineering & Computing (MBEC) papers

All IFMBE members can obtain free access from the website of their national member society or affiliated transnational organisation, provided of course that the society or organization makes access available on a private members' area of their website.

The society should apply directly to Dr Christoph Baumann, Senior Editor at Springer: christoph.baumann@springer.com

Christoph will provide the relevant information to allow the national member society to obtain access to the relevant pages of the Springer website. It can be noted that this gives full access to all MBEC papers, and also to other Bioengineering journals; Biomechanics and Modeling in Mechanobiology, Cardiovascular Engineering, Biomedical Microdevices, Health and Technology, and IFMBE Proceedings.

The society or organisation should then provide access to its members via a password protected area on its own web pages.

Promotion of young scientists DGBMT – the 2014 award of the “Family Klee Foundation“

The German association for biomedical technique in VDE e.V. is also in year 2014 giving a literature award from the foundation of the Klee family for the promotion of new scientific generations.

The award is in the amount of 5.000 Euros and it will be given in a form of a competition for excellent scientific work with the emphasis on the following :

- Biomedical technique as interdisciplinary subject
- Engineerly scientific solutions for current clinical issues
- Scientific contribution for the diagnostics or therapie.

The submitted scientific work can be in a form of publication, scientific article, dissertation or habilitation dissertation.

Please notify your colleagues about this proposal.

The deadline for the competition is 31 January.

Conditions for the participation can be found on www.vde.com/klee-preis.



Jan Maria WOJCICKI Obituary



In December 2013, the biomedical engineering community, the Federation and our Polish colleagues lost a great scientist, leader and teacher, Prof. Jan Maria Wojcicki. The loss is the largest for his family, Mrs. Alicja Wojcicki and Jan's daughters, Anita, Joanna and Marta. All those who knew Jan, share their sorrow.

I first met Jan when I visited the Institute of Biocybernetics and Biomedical Engineering (IBBE) of the Polish Academy of Sciences (PAS) in Warsaw in 1997, as a participant of an international conference held at the Institute. Already in those times, I remember

Jan as a prominent personality and a gentle fellow. We started collaborating more closely on biomedical engineering policy matters as members of the Federation's Protem Group (Working group for the European Alliance in the field of Biomedical Engineering), in the period from 2001 to 2003. In a number of occasions, Jan's Institute was hosting workshops and symposia which made permanent impact on the development of BME in Europe: let me mention just one, that of the BIOMEDEA project meetings in 2005. In 2007, Jan was elected to the Administrative Council (AC) of the IFMBE and during his term of office, his advice and wisdom were appreciated within the AC. Jan brought the Federation new ideas for collaboration with the BME industry. Though a scientist by body and soul, Jan understood that in real life, there is a need for strong collaboration of everything concerning health care, from researchers and professionals to policy makers and producers of medical devices. Within the IFMBE, Jan initiated a new working group, the Industry Working Group (IWG), which explored the processes and obstacles in collaboration between the academia and the industry, including small and medium size



IFMBE EXPRESS

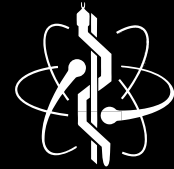
enterprises, and finally came with a proposal for establishing better understanding on combining industry needs and services offered by the academic institutions. Under Jan's leadership, the IWG built the platform "Atlas of Knowledge" enabling the matching of the industry needs with services of biomedical engineering research laboratories. The platform was developed in collaboration with Eucomed, the largest European organization of medical device producers, and since November 2013 initiated the filling of information on laboratories from a limited number of countries from middle and northern Europe into the platform. Plans have already been made to widen the platform to other European countries and to Latin America as well. Unfortunately, Jan will not be able to share the results of his efforts and the platform with us.

The research interests of Prof. Jan Wojcicki have lately been in artificial internal organs for metabolic support, in particular in artificial pancreas and in technologies for diabetes treatment. He was researching also blood purification processes by membrane techniques and technical support for intensive treatments. Prof. Wojcicki, introduced interest for new developments utilizing home telecare,

membrane technologies, micro-measurement technologies and various monitoring techniques aimed at the improvement of applied therapy, patient's comfort, safety and self-confidence.

Jan got his Ph.D. degree from the Warsaw Technical University, Faculty of Electrical Engineering, in 1978. He built his scientific and professional career as a member of the Institute of Biocybernetics and Biomedical Engineering where he became the Head of Laboratory (currently Laboratory of Bioengineering Methods for Support of Intensive therapies) in 1989. In 1991, Jan was granted Associate Professor degree in Biomedical Engineering at IBBE, and in 1999, he got full professorship in technical sciences. From 1994, Jan was Deputy Director of the IBBE PAS, and in 2007 he became the Director of the Institute of Biocybernetics and Biomedical Engineering Polish Academy of Sciences. In 2009, he became the Director of the International Centre of Biocybernetics PAS.

In his career, Jan filled many distinguished offices in international scientific and professional societies and associations: President Elect of the European Society for Artificial Organs, Member of the International Academy of Medical and Biological Engineering,



IFMBE EXPRESS

Member of the Division of Fellows European Alliance of Medical and Biological Engineering and Sciences, Member of the College of Fellows American Institute of Medical and Biological Engineering, Member of the Administrative Council of the International Federation for Medical and Biological Engineering (IFMBE) 2007-2012, Chairman of the Industry Working Group of the IFMBE since 2009, Member of the Executive Board of the ESAO 2006-2012, Member of the Interim Executive Board of the European Alliance for Medical and Biological Engineering and Sciences (EAMBES) 2003-2006, Member of the IFMBE Protem Group 2001–2003, Governor in the European Society for Artificial Organs 1998-2006.

For his contributions to the scientific community, Prof. Wojcicki was awarded multiple awards and distinctions: Award „Innovation for Health 2009” in a category of the Innovative Medical Technologies for Computerized system controlling treatment of the diabetic foot syndrome patients (TeleDiaFoS) in 2009, Distinction from the International Federation for Medical and Biological Engineering for Dedication and Outstanding Contributions as Administrative Council Member of the

IFMBE, 2006 – 2009, Diploma of Honorary Ambassador of the Polish Congresses, First Prize of the Scientific Committee of the V. Warsaw Days of Pharmacology, Pharmacotherapy and Pharmacoeconomy, Scientific Award Technical Department of the Polish Academy of Sciences for the cycle of elaborations related to “Technical Support of the Diabetes Treatment” in 1998. In 2011, Jan was presented the Knight’s Cross of the Order of Merit of the Republic of Poland.

It is very difficult to count all contributions of Prof. Jan Wojcicki to biomedical engineering community. Jan left a permanent mark in science and in biomedical engineering. For me, however, it is even more difficult to accept that such a great man and such an excellent friend left us forever far too early. My thoughts are with Jan’s family and his closest collaborators.

Ratko Magjarević
President, IFMBE



REPORT FROM IFMBE: Affiliated Societies



Report on MEDICON 2013

The XIII Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON 2013) was held in Seville, the capital of the Spanish Region of Andalusia, during the dates of September 25 to 28, 2013. This regional conference of the IFMBE is held every three years in a Mediterranean Country, and this year is the second that MEDICON (formerly known as MECOMBE) is brought to Spain, after the successful edition of 1986, where it was held again in Seville. Conference Chair was Prof. Laura M. Roa, from the University of Seville, and the Conference incorporated the XXXI Annual Meeting of the Spanish Society of Biomedical Engineering, as the host IFMBE member society.

27 years in the areas of science and technology represent a large leap, and even more in an ever-evolving field like that of Medical and Biological Engineering (MBE). During this large period, the MBE community has envisioned paradigm shifts, the formulation of new challenges, the impact of classical areas, the consolidation of themes like information technology in biomedicine, and pioneered the emergence of new fields like bionanotechnologies and nanomedicine. According to the current challenges for medical and social care, the theme chosen for this edition has been “Research and development of technology for sustainable healthcare”, focusing on the public concern on the appearance and use of emergent technologies under develop-



REPORT FROM IFMBE: Affiliated Societies

ment. This situation has produced a tremendous impact on Medicine and Biology from which it is expected an unparalleled evolution in these disciplines towards novel concept and practices. The consequence will be a significant improvement in health care and welfare, i.e. the shift from a reactive medicine to a preventive medicine. This shift implies that the citizen will play an important role in the healthcare delivery process, what requires a comprehensive and personalized assistance. In this context, society will meet emerging media, incorporated to all objects, capable of providing a seamless, adaptive, anticipatory, unobtrusive and pervasive assistance. The challenge will be to remove current barriers related to the lack of knowledge required to produce new opportunities for all the society, while new paradigms are created for this inclusive society to be socially and economically sustainable, and respectful with the environment. In this way, the conference program has been focused on the convergence of biomedical engineering topics ranging from formalized theory through experimental science and technological development to practical clinical applications.

Under the influence of this general theme, the technical program was structured into 10 themes, covering 53 tracks that were spread over 54 oral sessions and 4 poster sessions. The program was completed with 16 paral-

lel activities, including 5 special sessions, 4 workshops, 5 round tables, a networking lunch organized by the WimBE Committee, and the Federation Journal "Meet the Editor" Meeting. With the exception of the themes "Biomedical Signal Processing", "Biomedical Imaging and Processing", and "Health Informatics, E-Health and Information Technologies in Biomedicine", which were developed during all the days of the conference due to their higher number of papers, Wednesday 25 and Saturday 28 were devoted to special





REPORT FROM IFMBE: Affiliated Societies

sessions. The themes “Bio-micro and Bio-nano Technologies”, “Biomechanics, Robotics and Minimal Invasive Surgery” and “Molecular, Cellular and Tissue Engineering” were delivered during the second day, while “Cardiovascular, Respiratory and Endocrine Systems Engineering” sessions were scheduled for the third day. “Clinical Engineering”, “Medical Devices and Sensors”, and “Neural and Rehabilitation Engineering” were developed during the second and the third day. The timetable of a full-day included two technical sessions, a plenary session and a poster session during the morning and the same structure in the afternoon.

The conference organization relied on a Regional Conference Organizing Committee with representatives from 10 Mediterranean IFMBE member societies and 2 transnational societies, an International Program Committee of 100 members, an International Scientific Committee of 75 members, and a Local



Organizing Committee of 11 members. The conference venue was the Convention Center of the Melia Sevilla Hotel, located at the city center, and Grupo Pacifico Company was appointed as the official agent for support services, social program and technical secretariat.

The conference program took advantage of the participation of five keynote speakers: Prof. Meyya Meyyappan (NASA AMES Research Center, USA), Prof. Ratko Magjarevic (University of Zagreb, Croatia), Prof. Dov Jaron (Drexel University, USA), Prof. Guenter Rau (RWTH, Aachen University, Germany), and Prof. Alan Murray (Newcastle University, UK), who delivered plenary sessions with recent advances on topics ranging from bionanotechnology to rehabilitation systems, tissue engineering, or cardiovascular medical devices. The program included five invited papers authored by Prof. Ajay Agarwal (CSIR Central Electronics Engineering Research Institute, India), Prof. Richard Kirsner (La Trobe University, Australia), Prof. Jaakko Malmivuo (Aalto University, Finland), Prof. Stephen P. Morgan (University of Nottingham, UK) and Prof. Nazim Agoulmine (University of Evry Val d'Essonne, France). These invited papers were presented to open the technical sessions of their corresponding tracks, in topics ranging from nanowire sensor arrays to medical device development or mHealth in developing countries.



REPORT FROM IFMBE: Affiliated Societies

The opening ceremony was held at the main building of the University of Seville, and was preceded by a guided tour to the Rectorate, a 18th-century stone building regarded as one of the most notable and splendid examples of the industrial architecture from the era of Spain's ancien régime. Indeed, it was conceived to host the Royal Tobacco Factory, becoming the most prominent such institution in Europe and being the scenario that inspired the myth of Carmen. Since the 1950s, the building hosts the Rectorate of the University of Seville. Founded in 1505, it was preceded in Spain only by the Universities of Salamanca, Santiago de Compostela and Alcalá de Henares. Currently, the University of Seville hosts 130 departments, 66 BSc programs, 86 MSc programs and 152 PhD programs. During the 2012/2013 academic year over 82000 students were enrolled in courses, and the teaching staff was over 4200. The opening ceremony (see Fig. 1) was chaired by Prof. Manuel García-León, Vice-President of Research of the University of Seville, and counted on the participation of Profa. Laura M.



Figure 1: A picture taken at the opening ceremony. From left to right: Profa. Laura M. Roa, MEDICON 2013 Conference Chair; Prof. Manuel García-León, Vice-President of Research of the University of Seville; Dr. Jerónimo Pachón, General Director of Quality, Research, Development and Innovation of the Regional Ministry of Health; Prof. Ratko Magjarevic, President of IFMBE; and Prof. Javier Reina-Tosina, MEDICON 2013 Local Organizing Committee Chair.

Roa, MEDICON 2013 Conference Chair, Dr. Jerónimo Pachón, General Director of Quality, Research, Development and Innovation of the Regional Ministry of Health, Prof. Ratko Magjarevic, President of IFMBE, and Prof. Javier Reina-Tosina, Local Organizing Committee Chair. It was followed by a welcome reception at the main courtyard of the Rectorate building, organized by the local committee (see Fig. 2).



Figure 2: Welcome reception in the main courtyard of the Rectorate building.



REPORT FROM IFMBE: Affiliated Societies

Over 600 delegates participated in the conference, with representation from the five continents and 47 countries from all over the world (see Fig. 3), with a special significance

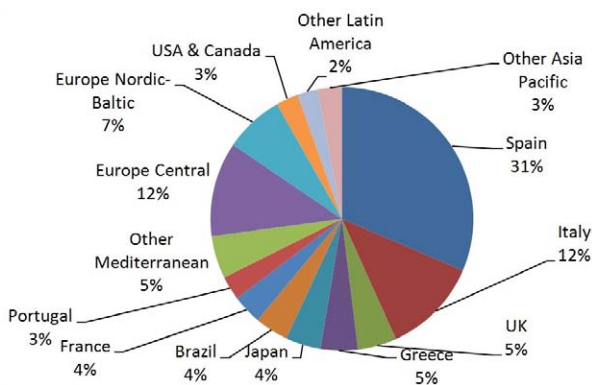


Figure 3: Distribution of participants in MEDICON 2013 by countries and geographical regions.

of Spain, Mediterranean countries like Italy, European countries like UK or Finland, and overseas countries like Brazil, Japan or USA. Other figures regarding the participation in the MEDICON 2013 are 519 papers submitted for review by the International Program Committee, from which 486 were accepted

and 29 rejected. Accepted papers were distributed in 333 for oral sessions and 153 for poster sessions. All the submitted papers were reviewed, at least by two members of the International Scientific Committee & International Program Committee, with exception of the papers submitted to the Young Investigator Competition (YIC), which were reviewed, at least, by four referees.

MEDICON 2013 included a Young Investigator Competition with 10 finalists (see Fig. 4) selected from 162 candidates. The finalists presented their papers in two sessions chaired by the members of the YIC Competition. The First Prize was awarded to Mr. Gonzalo César Gutiérrez-Tobal, from the University of Valladolid, Spain, for his work "Adaboost classification to detect sleep apnea from airflow recordings"; the Second



Figure 4: A picture with the finalists of MEDICON 2013 Young Investigator Competition.



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Prize was awarded to Mr. David Naranjo, from the University of Seville, Spain, for his work “Experimental characterization of active antennas for body sensor networks”; and the Third Prize to Mr. Aristidis Vrahatis, from the University of Patras, Greece, for his work “Network-based modular markers of aging across different tissues”.

The gala dinner was held in the courtyard of the Old Audience Seville Building . This court, its front page and stairs belongs to the Renaissance Period. The building is front-to-front with the City Town Hall, configuring one of the landmark places of Seville.

The closing ceremony was preceded by the keynote lecture of Prof. Alan Murray, who was awarded with a plaque celebrating his elevation to honorary life member of the IFMBE (see Fig. 5). The ceremony was held at the conference venue and counted on the participation of Prof. Laura M. Roa, MEDI-

CON 2013 Conference Chair, Prof. Joseph Barbenel, Chair of the YIC Committee, Prof. Shankar Krishnan, Secretary General of the IFMBE, and Prof. Ratko Magjarevic, President of the IFMBE.



Figure 5: IFMBE delivers a plaque to Prof. Alan Murray (left 2nd) in recognition to his elevation to IFMBE Honorary Life Member, in the presence of Prof. Fumihiko Kajilla (right 1st), during the MEDICON 2013 closing ceremony.

The social program for accompanying persons included a halfday tour to the baroque in Seville, and a guided visit to the Andalusian Parliament. During their stay in Seville, participants had the opportunity of enjoying





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the rich artistic heritage of the millenary town, which is proud of its fusion of cultures. The conjunction of the Spanish weather, history and natural resources have shaped it as a modern city with an outstanding projection at the levels of technological research and industry, and biomedical research. All the improvements made in the city during the last decades have allowed Seville to become a cosmopolitan and easy-to-get destination.

In spite of all the problems that the Mediterranean region is currently facing due to the financial and political crisis, we are proud of the great diffusion of this Conference, with participants coming from all the continents. This participation is a sign that the MBE community can contribute to overcome the challenges that are affecting society. We would like to share this success with all the members of the committees, sponsors, institutions, participants, and individual persons and that have made possible the celebration of this event, and our best wishes for the success of the next edition of the MEDICON, which will be held in Cyprus in 2016.



Meeting of Committee Chairs reporting to AC



IFMBE Journal Committee Meeting



Clinical Engineering Committee Meeting



women-in-engineer's meeting



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EAMBES position paper for Horizon 2020 research in technologies for health and medicine:

A comprehensive biomedical engineering approach for future personalized medicine and healthcare technologies

Contributors: Jari Hyttinen, Karin Lohmann, Andrei Linnenbank, Timo Jämsä and James Kennedy

Executive summary and EAMBES recommendations for Horizon 2020 research

This position paper by the European Alliance of Medical and Biological Engineering and Science (EAMBES) aims to promote Biomedical Engineering, its approaches and above all, highlights its potential for Europe on Horizon 2020.

This document is a continuation of the Expert Policy Workshop on Biomedical Engineering at the European Parliament on March 27th 2012 hosted by the European Parliamentarian Dr Thomas Ulmer (EPP, Germany) in collaboration with EAMBES that produced ten recommendations as to contribute to the current debate on European research and innovation. The main outcome of the Policy Workshop was: “Biomedical Engineering is a cross-disciplinary science based on Medicine, Biology and Engineering. It is fundamental for

a variety of highly innovative technologies and products or processes of the health care sector. Biomedical Engineering should be understood as a stand-alone discipline to better utilise resources and fully realise the corresponding opportunities. It is thus important, that the European Union recognises the full potential of Biomedical Engineering and consequently promotes collaborative research in this field“. The entire recommendation can be found at: <http://www.eambes.org/news/report-on-the-expert-policy-workshop-on-biomedical-engineering>

With the current EAMBES position paper we would provide practical recommendation to Horizon 2020 calls on research in technologies for health and medicine. We would like to inform the national and European policy makers as well as other stakeholders about the future perspectives of this multidisciplinary domain so important for our society and elucidate our perspectives



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of future health technology research. In the previous Framework Programmes funding of biomedical engineering at EU level has been very fragmented and near the Horizon 2020 launch, the EU still lacks a grand vision and a consistent approach to fund for biomedical engineering.

Biomedical engineering and sciences

(BMES) encompasses the advancement of fundamental concepts of engineering approaches applied in biology and medicine. Everyone encounters products of BME regularly when visiting the GP, a hospital, a nursing home, or even everyday life. Researchers in BMES develop innovative approaches for medical research and clinical applications for example in form of new computational models, miniaturized devices, novel materials, algorithms, processes and biological systems analysis. Moreover, the integration of these developments in biology and medicine facilitates better medical practice and health care delivery, or tools for health coaching and prevention, diagnosis and treatment and rehabilitation of trauma and diseases. Above all biomedical engineering and sciences aims at improving our quality of live, longevity and our functionality as active member of the society through this integration of engineering and medicine.

The uptake of the recommendations listed below, the specific inclusion of biomedical engineering in Horizon 2020 would do much to address the growing problems that have been identified during the Commission reflection process on chronic diseases and would be a step towards addressing the problems described in the Commission Communication on Active and Healthy Ageing and novel developments of personalized medicine.

EAMBES recommendations for health technology research in Horizon 2020:

EAMBES view is that there are three major challenges in BMES research to deal with:

- 1) How to enable the early **adoption of emerging technologies in healthcare** that could offer cutting edge developments in industry?
- 2) How to ensure the **integration of the multidisciplinary research, knowledge and technologies** into approaches in clinical practice?
- 3) How to provide resources **to transfer the cutting edge technology into clinically proven products** which will be reimbursed by the healthcare system?



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To ensure the success of Horizon 2020 in providing novel approaches to European society and industry in healthcare and health technology, the following approaches are recommended:

1) Different types of projects - smaller ones with cutting edge approach and larger ones with integration approach - are needed. In all types of projects a long term perspective to real applications in healthcare is needed. These projects should also provide effective mechanisms that favour not only those consortia and research that include existing Small and Medium Enterprises (SME), but above all those that aim to create spin-offs and start-ups to commercially exploit the research output.

2) Funding schemes should include resources for proof of concept studies to ensure that clinical and commercial breakthroughs as novel clinical and biological and methods, procedures, industrial products and healthcare services.

3) Calls should aim at integrating new emerging technologies, medical and biological science to place Europe as a global leader in medical technology. A series of calls should be implemented each with an emphasis on

the integration of different technologies to tackle real medical challenges.

4) To speed up the transfer of research findings new programmes are needed which allow the prosecution of successful projects towards commercialization.

5) To speed up the utilization of cutting edge technology and its integration to healthcare, the principles and ideas of Future Emerging Technology scheme should be extended towards unproven but potentially high payoff novel concepts in health technology and biomedical engineering.

Justification for the EAMBES recommendations

Need for better approaches for healthcare

Facing the challenges of a diminishing and ageing population, Europe needs an overall policy of growth to improve competitiveness and ensure economic stability in achieving the Lisbon goals and in its transition to a knowledge society. Innovation and development in biomedical engineering and technology are of increasing socio-economic importance for the health and well-being of European citizens.



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The ageing of society is becoming not just European but global challenge. Innovative and cost-effective methods, tools and procedures enabling healthier and independent ageing are required more than ever in these times of economic crisis. Independent ageing and the fact that we can often stabilize previously deadly diseases, turning them into chronic diseases, also means a shift of BME technology from e.g. hospitals to the patient's home. Novel stem cell approaches and personalized medicine based on gene and protein "omics" are emerging. All these developments call for the increasingly important role of integrative platforms - comprehensive biomedical engineering approach - that integrates the novel technology into medicine and biology. We need not just novel technologies but also faster transfer of emerging technologies to the benefit of healthcare and the society and individuals. In addition, evidence based proof of the concepts of technology, its usefulness and efficacy proven in medicine and healthcare is necessary.

Good healthcare, and efficient research, involves all major actors and stakeholders, e.g. industry, research and academia, and healthcare organizations to reach cost and clinically effective solutions.

Biomedical Engineering – an economic opportunity for Europe

In addition to the societal outcome, biomedical engineering and health technologies provide an opportunity for strong and sustainable economic growth and high technology business opportunities for Europe. In most European countries there is substantial biomedical engineering and health technology industry. The biomedical engineering sector is vital not only for the health and well-being of European citizens, but also for the "wealth" of the European economy. In comparison to other sectors the growth rate of biomedical engineering is about 5 -7% per year. Moreover, this sector has potential to become important contributor to the European industry. In some countries it already is one of the leading high-tech industries. For example, in Finland health technology comprises 29% of Finland's total high-tech industry exports in 2011. Biomedical engineering is one sub-domain where Europe still has some leadership which can and must be strengthened in order for Europe to maintain and enhance its competitive edge.

Interestingly, in Europe biomedical technology and engineering start-ups attract as much venture capital as pharmaceutical start-ups. On the other hand, the transfer of BMES



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research results - combining various natural sciences and engineering principles and approaches with healthcare and medicine - comprises fundamental challenges. BME is profoundly an ultra-multidisciplinary area which can be seen in research as well as in the products. Moreover, all phases from basic research to development, manufacturing and finally entry to the health market involve large numbers of stakeholders and players. In comparison to, e.g., communication industry, the health market is completely different due to framework conditions like strong regulations and sometimes complex reimbursements. Europe does not recognise the importance of this industry sector and its specific needs especially in research. Countries like the US have already started dedicating programs for biomedical technology. As a result they are at the forefront of medical technology. For example, they created an ad-hoc public body (National Institute of Biomedical Imaging and Bioengineering) to support it.

Biomedical Engineering – a comprehensive health technology approach

In BME we integrate basic technologies such as electronics, material science, computational methods and information technologies etc. into medicine and biology eventually leading

into health technologies used in prevention, diagnosis and therapy etc.

Majority of new knowledge and approached in medicine are based on such technologies. For example, bioinformatics is empowering fast genome sequencing, which will enables personalized medicine or biomaterial research supporting tissue engineering development based on stem cell technology. Unfortunately most research and funding in these areas takes place in “silos”. For example calls within the soon ending EU 7th frame work programme are in majority referring to very specific technologies e.g. stem cells, bioinformatics, computational modelling or imaging. These research projects undoubtedly have augmented medical practices and have provided commercialization opportunities. However, having in mind the future needs of Europe’s ageing population, costs of healthcare and the societal challenges we face, there is a need for the integration of multi-type of technologies into healthcare especially into diagnostics, treatments, novel spare parts and rehabilitation. To gain real new clinically applicable systems this “integration approach” is vital.

Biomedical engineering has the potential to enable real proof of concept of future and



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emerging technologies in healthcare however, this requires a new paradigm in research funding. As mentioned already by the European Commission “when shifting the approach to European framework for research and innovation, science and research need a cross-disciplinary approach”. Biomedical engineering is a prime example in the healthcare sector which shows that close collaboration between medical, engineering and life science expertise leads to innovation and novel healthcare tools.

Potential Outcome

Support for comprehensive biomedical engineering approach could lead to breakthroughs in several fields like diagnostics and intelligent implants. It could contribute to more advanced, accurate and safer medical technological standards. Critical mass could be gathered to produce innovate health technology through interdisciplinary biomedical engineering and BMES research at European level.

Many areas of technology are now emerging, providing partial solutions for healthcare technological problems. Comprehensive support for biomedical engineering has the potential to create the groundwork for European grand vision and enable the transfer of these emerg-

ing and future technologies to the benefit of European people, healthcare, industry and society in large.

In the interests of maintaining Europe as a competitive force in medical technology and in ensuring the long term health of its citizens, biomedical engineering must become a priority of the EU health agenda.





Development of BME in Spain

The Spanish Society of Biomedical Engineering

Born in 1978 under the name of Spanish Association of Bioengineering (Asociación Española de Bioingeniería, AEB) and moved in 1994 to Spanish Society of Biomedical Engineering (Sociedad Española de Ingeniería Biomédica, SEIB, Fig. 1), it is the major scientific society merging together professionals, researchers and students who develop their activity in the different fields of Medical and Biological Engineering (MBE) or are motivated within this area, and it is a member society of the IFMBE. The origin of SEIB is within several Spanish societies, especially the Spanish Society of Physiology, with which it established a tight relationship during its first years. Later on it acquired own personality and is registered in the Spanish Record of Scientific Societies as a non-lucrative association. Currently, the main research groups in Spain active in areas like Biomedical Signal Processing and Imaging, Neural and Rehabilitation Engineering, Health Informatics, E-Health, Telemedicine and Information Technology in Medicine, Bioinformatics, Cardiovascular, Respiratory and Endocrine Systems Engineering, Biomechanics, Medical Devices and Sensors,

and Bio-Micro and Bio-Nano Technologies, belong to SEIB, as well as members coming from several health institutions and industry.



Fig. 1: Logo of SEIB.

SEIB current bylaws were approved in 2004 and its main objective is to ease the contact among researchers, professionals and students, and in general between people and institutions active in the fields of MBE, fostering the practice of scientific research, technical development, and advisory in related fields. Its activities range from scientific-technical objectives, to academic and educational issues, or technological transfer. Regarding the former, SEIB aims at promoting mutual collaboration and scientific activity among its members, keeping a tight and active relationship with peer-institutions at other countries and transnational societies, promoting the multidisciplinary research where it applies, and promote the joint participation of its members in R&D projects at national and



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European levels, or support the participation of its member groups in large projects. Regarding the academic plane, SEIB promotes the organization of courses within the scope of MBE, and follows the development of high-education programs on MBE at national level, fostering the optimization of their implementation. Finally, from the technological transfer perspective, SEIB establishes relationships with companies performing their activity in related sectors, collaborates with similar associations at national and international levels, and promotes an internal and external discussion about technological innovation in MBE through the organization of scientific events.

There are three kinds of membership modalities defined by the bylaws of the society: honorary members, sponsor members, and members. The latter include both senior members and student members. The Administrative Committee (AdCom) of SEIB is chaired by a President, who is elected every four years. The other positions in the AdCom are Vice-President, Secretary General, Treasurer and up to four Members at Large. Of the latter, one is commissioned for relationships with industry, and another with educational issues.

The main activity of SEIB is the organization of an annual event called Annual Conference

of the Spanish Society of Biomedical Engineering (CASEIB), in which the members submit papers for presentation so that research groups, professionals, companies and associated institutions, and specially students can get a direct contact with the latest advances accomplished during the year. Currently, CASEIB counts 31 editions. During the CASEIB, it is also held the General Assembly of SEIB.

CASEIB has been incorporated to international conferences in related areas that are held in Spain. For example, MECOMBE 86, ESEM 99 and the recent MEDICON 2013. CASEIB represents an unparalleled activity to foster the relationships within the members of the society and with other societies that are invited to present their advances in related fields. Currently, SEIB has agreements of collaboration with the Spanish chapter of the IEEE-EMBS, the Spanish Society of Electro-Medicine and Clinical Engineering (SEIIC), the Spanish Society of Health Informatics (SEIS), the Spanish Federation of Healthcare Technology Companies (Fenin), and more recently with the Spanish Society of Surgical Research (SEIQ), and the Spanish Network Center on Biomedical Research in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN).

SEIB website is <http://seib.org.es>



REPORT FROM IFMBE: Affiliated Societies

MBE in Spain

Activities around MBE in Spain are spread over the areas of research, education and industry. Regarding the former, most of the activities are developed by research groups at universities. The map of biomedical engineering research at the Spanish universities is geographically balanced across most of the regions, although the size of the groups can show important differences. Most of the groups belonging to SEIB perform their activity within Faculties of Engineering and their allocation of funds is dependent basically on research projects and grants from peer-reviewed public calls at national and European levels, as primary sources, and contracts with companies as secondary sources.

An important step for the recognition of MBE maturity in Spain was the establishment in 2006 of CIBER-BBN (www.ciber-bbn.es, Fig. 2), a networked center of excellence under the leadership of the Health Institute Carlos III (ISCIII), the main biomedical research public institution depending directly on the Ministry of Health. CIBER-BBN is one of nine CIBER consortia in the country, created to promote research excellence and build a critical mass of researchers in the fields of biomedicine and health sciences. Currently, it has 45 full-member groups, 2 associated members, and

3 associated clinical groups. The research programs of the CIBER-BBN are structured around three divisions: bioengineering and biomedical imaging, biomaterials and tissue engineering, and nanomedicine, with the centre's research aimed at developing both systems for prevention, diagnosis and monitoring and related technologies for specific treatments. The overall objectives outlined in the CIBER-BBN scientific plan include increasing the research capabilities of the member groups by sharing resources, coordination and promotion of synergies.



Fig. 2: Logo of CIBER-BBN.

From the educational perspective, while the presence of MBE in doctorate programs is long-standing in Spain, the development of high-education programs at undergraduate and master levels is recent, and evolved in time with the adoption of the alignment of Spanish universities with the European Higher Education Area. In the 2000s SEIB played a significant role as an advisor institution to the Ministry of Education, and was commissioned with the development of a national-wide program on Biomedical Engineering. The draft



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of the program set the roots for the current programs available in Spain. Currently, there are 7 undergraduate programs — in order of establishment: Technical University of Catalonia, Univ. Navarre, Univ. Barcelona, Univ. Carlos III, Univ. Pompeu Fabra, Technical Univ. of Madrid, and Technical Univ. of Valencia —, and 6 programs at master level — Technical Universities of Catalonia, Madrid and Valencia, Univ. Zaragoza, Univ. Navarre and Public Univ. Navarre.

Regarding industry, Fenin (www.fenin.es) is the Spanish federation of healthcare technology companies. Fenin gathers over 520 national and international large, medium and small enterprises related to products both for hospital and laboratory use, including prostheses, medical devices and accessories, diagnostic, monitoring, therapy and hospital equipment. Market activities range from the area of manufacturing to import and distribution. The companies and business associations that make up Fenin are responsible for more than 80% of the total sales to the Spanish health technology market. According to their 2012 report, about 72% of the market corresponds to the public health sector, with an approximate volume of business of some 7.700 million Euros. The export trade of the Spanish health-

care technology sector approached 1.900 million Euros in 2012. The enterprises that form Fenin employ, either directly or indirectly, about 29.000 people.



REPORT FROM IFMBE: Affiliated Societies

Medical engineering in Poland

Ewa Zalewska, PhD, DSc, Assoc. Prof.

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Institute of Biocybernetics and Biomedical Engineering
Polish Academy of Sciences.

History

Medical physics and medical engineering in Poland has almost 80 years of history. Very early activity in this field constituted the common roots for medical physicists and engineers. The birthplace was the Radium Institute established in Warsaw in 1932, thanks to initiative of Maria Sklodowska-Curie. The assistant and collaborator of Maria Sklodowska-Curie, Prof. Cezary Pawlowski, has founded in 1934 the Physics Department of the Radium Institute and organized first courses on medical physics and biomedical engineering. After the II world war in 1946 graduate studies were started at the Warsaw University of Technology, as the world's first regular academic courses in electromedical engineering, organized by Prof. Pawlowski. The graduates have started collaboration with medical doctors in clinics as well as construction of medical equipment.

During years of activity in this field, the group of specialists was growing up and in 1965 the Polish Society of Medical Physics was founded. The society has its own journal since

1966. Firstly, Postepy Fizyki Medycznej (in polish) and since 1995 – Polish Journal of Medical Physics and Engineering. This society was a common assemble of medical physicists and engineers up to 1999 when the Polish Society of Biomedical Engineering was founded.

Education

Education in biomedical engineering, started in 1946 at Warsaw University of Technology, has been later developed at several universities. Actually, more than 20 universities offer education in this field. Until the academic year of 2005/2006, education in biomedical engineering was a specialization among other fields of studies, e.g. mechanics, automatics or electronics. The development of new medical technologies required a new approach to biomedical engineering education. The program of education has been upgraded by the Ministry of Science and Higher Education and a new field of studies, called "Biomedical Engineering" (BME) has been established. The BME teaching meets legal regulations including national standards for academic teaching set out by the Ministry of Science and Higher Education and with the guidelines of the Bologna Process (including the Educational Credits Transfer System). The current program offers the first degree study (engineer), the



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second degree (MSc) and third degree (PhD).

Specialization

The law of Ministry of Health introduced in 2002 the specialization in medical engineering. The postgraduate education program in Medical Engineering is being implemented under the auspices of the Ministry of Health, the Medical Centre of Postgraduate Education and the National Consultant in the field of medical engineering. The postgraduate study takes almost 3 years, including practice in various clinics. This course is completed by a state exam consisting of a practical and theoretical part proposed by the Medical Examination Centre. One obtains a title and certification of specialist in medical engineering. Professional competence gained during postgraduate education entitles to work in a clinic as a medical engineer. What is more, due to the law, participation of certified specialist in medical engineering is obligatory in some advanced medical procedures. There is a very important role of the National Consultant in medical engineering at the Ministry of Health that coordinates this activity.

The role of medical engineers

There was very good tradition, up to 90-thies, that in majority of clinical departments there were staffs of few engineers and technicians that took part in every day work, having posi-

tion of partners of medical doctors. They have prepared and performed examinations using medical equipment and analyzed data. Due to economical limitations this model of coactivity is not continued. At present, in hospitals there are small service teams.

Since several years we are working on the recovery of the principal role of medical engineers in hospitals. To this goal the mentioned above changes in law have been lately introduced. On the other hand, these changes in law increase the divergence between problems of biomedical engineering in academies and in practice. In 2012 we have started with new journal, *Inzynier, fizyk medyczny* (in polish) dedicated to medical engineers and physicists working in hospitals and therefore, addressing only practical issues.



REPORT FROM IFMBE: Affiliated Societies

12th Belgian National Day on Biomedical Engineering



Marc Nyssen
Secretary BSMBEC / National Committee BME, Belgium
Professor, Department of Biostatistics and Medical Informatics, Vrije Universiteit Brussel, Belgium

The Belgian Society and the National Committee on Biomedical Engineering (within the Royal Academy) teamed up with the IEEE EMBS Benelux Chapter to organize this event on December 6th.

Theme this year: "Robotics in Medicine".
After the introduction by Sabine Van Huffel (National Committee and IEEE EMBS), the keynote speakers brilliantly highlighted different aspects of robotics in medicine:

prof. Frans Van der Helm (Delft University)

gave a complete overview, focusing on robots in surgery, prof. Jos Vander Sloten (Katholieke Universiteit Leuven) highlighted robotics in orthopedics, prof. Frédéric Vanden Eynden (Universite Libre de Bruxelles) a surgeon, gave the point of view of the medical practitioner and prof. Dirk Lefeber (Vrije Universiteit Brussel) focused on the engineering aspects: from mechanics to control theory and energy management.

The 240 attendees participated in a round table discussion (see below) after the lunch break, followed by a "1 minute presentation" session, where all 45 poster presenters briefly (with a single slide) presented the work which they expose on their poster.

The poster session and proclamation of the poster prizes closed the event.



Sabine Van Huffel welcomes the participants in the Royal Academy, Brussels



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The “round table” discussion with the keynote speakers attempted to come to conclusions about “the way to go ahead” in medical robotics.

Frans Van der Helm stated that robot interventions in medicine have reached a precision of about 2 millimeters; major contributions to medicine can be expected if the field develops further in a way to effectively give assistance to health care workers and patients, he sees two developments that may soon give results: the Lopez 2 device, enabling “freedom of therapy” and exoskeleton devices to help spinal cord injured patients.

Robotic applications in medicine are primarily in surgery and in orthopedics. Surprisingly, the effective impact of robots in surgery is very low at this moment and it does not seem to increase: less than 1% of surgical interventions have any benefit from robot technology. Although in orthopedics this may be somewhat more, still there is a lot of persuading evidence to be produced to obtain widespread adoption.

Frédéric Vanden Eynden, a surgeon himself, stated that the key elements for success are: robotics should improve the capabilities of the surgeon, without compromise. Currently robotic surgery is an enabling technology to some extent, but at the cost of sensory feedback this flaw must absolutely be overcome in order to ensure large scale usage. A second point would be that the patients be reassured that the decision mak-

ing is at all times with the human practitioner and not with the robot.

Jos Vander Sloten added that the bottom-line is that robotics offer effective solutions to problems, moreover there is a question of “perception” by the patient: the quality improvement should be tangible. An evidence base is the only way to convincingly introduce robotics into medical practice: if robotic interventions consistently lead to better results, this will be the way to go.

Dirk Leyeber highlighted the “costs” aspect: robot interventions or assistance by robots must be made cheaper in order to become widespread. A multidisciplinary approach and a long term vision are the only options to achieve this. The role for biomedical engineers lies in inventing, developing and testing these robotic solutions, in response to the questions put forward by the health care professionals

summary:

The way forward for robotics in medicine is to find effective ways to help and assist health care professionals, without compromise but clearly keeping the decision making and control over the operations in the hand of humans.

A long term multidisciplinary approach, keeping in mind health care economics will ultimately lead to an important robotic impact on medicine, with proven results, based on clear evidence.



FEATURE COLUMN: BME in Europe

Stories from Women in Biomedical Engineering in Europe

My short story of a noble profession



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My first encounter with medical physics occurred in 1999 when I visited, as a prospective PhD student, the Department of Medical Physics at the Royal Adelaide Hospital, South Australia. The department fascinated me, and so did the medical physicists with their knowledge and dedication. I had the opportunity to spend a couple of weeks in the department to learn about the job of a medical physicist. Needless to say, after that work experience, I knew that I would like to pursue this career.

A few years later, I became a medical physicist at the above department, finishing at the same time my PhD in radiobiology. More exactly, I was doing Monte Carlo modeling of tumour growth and development, investigating tumour response to radio- and chemotherapy.

Following the advice of one of my supervisors who was a medical oncologist, I focused on a particular group of tumours: head and neck.

For all of us doing *in silico* modeling, one thing is acknowledged: “Essentially, all models are wrong, but some are useful” (G.E.P. Box). That usefulness can be materialized into a further idea, an understanding of a principle or even a confirmation of an experimental result. The outcome of my modeling showed that the chemo agent cisplatin, when given in daily doses concurrently with radiation, leads to a better tumour control than when administered in larger, weekly doses. At about the same time, the results of a clinical trial were published and they were matching my conclusions. I was obviously pleased with the results and one day a journalist from the University of Adelaide came over to the hospital for an interview about my work. The short article in *The Adelaidean* stimulated me to put even more passion into my work.

A few days later, the phone rang in my office and a gentleman asked for an appointment to discuss my research results. He told me that he was a cancer patient undergoing radiation and cisplatin treatment for a head and neck



FEATURE COLUMN: BME in Europe

tumour and that reading the article in the university's journal gave him more hope. I immediately explained to him that I was not a medical doctor and I was not qualified to give him any medical advice, but he was very insistent and eventually I gave in. He came the following day accompanied by his adult daughter and told me that he saw the journal absolutely by chance, when crossing the university campus, and read my article with interest. He told me about his journey as a cancer patient and his trust in today's cancer research. He believed that if his current treatment is not successful, a new schedule based on the new findings will lengthen his life.

I never saw that gentlemen again, but that short visit marked me for life. This single patient managed to make me believe even more in what we are doing as professionals, and by showing his faith in my humble work, he strengthened my perspective on medical physics and our role in society.

The IOMP initiative to mark Marie Curie's birthday as the International Day of Medical Physics is very welcome and has stimulated several events all around the world. I have encouraged my students to get involved in the active life of our medical physics community,

and to raise this vocation to a higher level. I believe that we need greater efforts to disseminate our role within society and to educate people around us about radiation and its impact on our lives.

Medical physics is a noble profession. It certainly deserves a day in the calendar...

Article by Lena-Kajsa Sidén

During the annual two-day Swedish conference Medical Technology Days – this year taking place in Stockholm, Ratko Magjarevic participated as honoured guest speaker.

It is a pleasure for me to report that two younger members of the conference committee, Dr Anna Bjällmark from the Royal Institute of Technology – KTH, and Dr Sabine Reinfeldt from Chalmers University of Technology, arranged a novel item in the conference programme – an "Inspiration luncheon" for women working in Medical technology / Biomedical engineering, regardless of sector. Around 70 women joined us to listen to Professor Johanna Adami, Head of the Health Division of the Swedish Governmental Agency for Innovation Systems (VINNOVA), the major agency providing grants for innovative research and other activities catering to important societal



FEATURE COLUMN: BME in Europe

needs in Sweden. She gave an informal talk about her career – including previous activities in research (clinical epidemiology), hospital intensive care as medical director of an MT company -- and she suggested ways to try to balance various tasks to achieve a wholesome combination.

I would also like to add that Professor Karin Wårdell, Linköping University, contributed a short oral report of what had been discussed at the conference in Seville Karin and I both attended the IFMBE Congress in Beijing last year, and she reminded those of us who participated in the lunch meeting at the conference that there is plenty of room for improvement in the gender balance of plenary speakers, board members, etc...

Summing up the luncheon at this Swedish event, it proved an interesting and according to comments that I overheard, a highly appreciated element of the conference agenda. Thus I think there will be a repeat of this next year, when the conference will be held in Gothenburg. Sabine and her friends in WiSE (Women in Science) from Signals and Systems at Chalmers University of Technology and Medtech West – a collaborative regional initiative – will have the chance to build further on the experiences they have had this time in

Stockholm.

Photo of Johanna Adami:



Additional article by WiSE

As a young researcher, you ask yourself whether your job is good, whether you are efficient enough, whether you will be able to face the constantly evolving environment. Research is a real challenge for an individual and even if characterized by a dynamic and fresh environment, it has room for improvement concerning gender related issues. The major problems are related to the low representation of women in higher academic positions and in scientific advisory boards, especially in technical fields such as engineering and mathematics, as shown in the recent report “She Figures” from 2009.



FEATURE COLUMN: BME in Europe

When WiSE(Gothenburg, Sweden) was born in 2011, we tried to offer a space for people to discuss the complex subject of gender equality in academia. We started by offering a warm environment where people could try to find reasons for the imbalance, and where possible, some solutions. Following the idea that “You can’t be what you can’t see”, during each of our WiSE lunch seminar, a role model inspires our participants by describing her scientific work and her experience as a woman in academia. The possibility to hear interesting stories, share work-related issues and personal challenges have several benefits; the most important one is coping with the feeling of isolation and hopelessness that often young researchers experience. Meeting with role models who succeeded in their careers is essential to concretely impact the potential development of our career as women. It makes our future possibilities more visible and accessible.

The inspirational lunch with Johanna Adami was an example of all the aforementioned characteristics. The contagious energy of Johanna reached our large audience and offered a starting point for discussions dur-

ing the mingling that followed. This experience offered not only extra energy to all the young researchers who joined the lunch, but it was also an occasion for creating a dialogue between different universities in Sweden and for fostering potential future research collaborations.

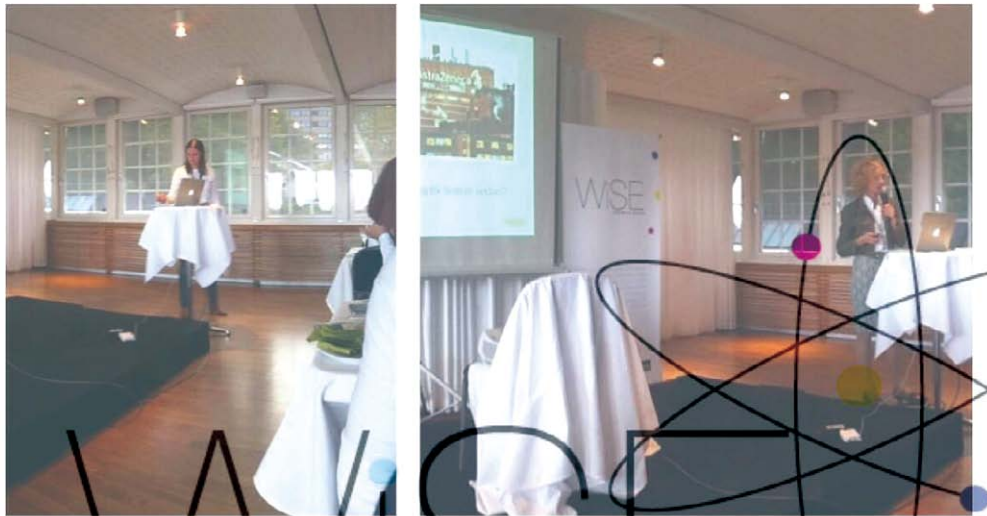
More information on WiSE you can find on medtechwest.se/wise. Like us on Facebook: GET WISE for the latest information.

Photo of WiSE:

(Order in the below photo): Organizing committee of WiSE: Sabine Reinfeldt, Assistant Professor at Signals and Systems, Chalmers University of Technology; Lisa Snäll, Communicator at Innovationslussen and at Gothia Forum; Sofia Lindqvist, Communicator at MedTech West and at Sahlgrenska University Hospital; Hana DobsicekTrefna, Assistant Professor at Signals and Systems, Chalmers University of Technology; Irene Perini, PhD at Clinical Neurophysiology, Sahlgrenska University Hospital.



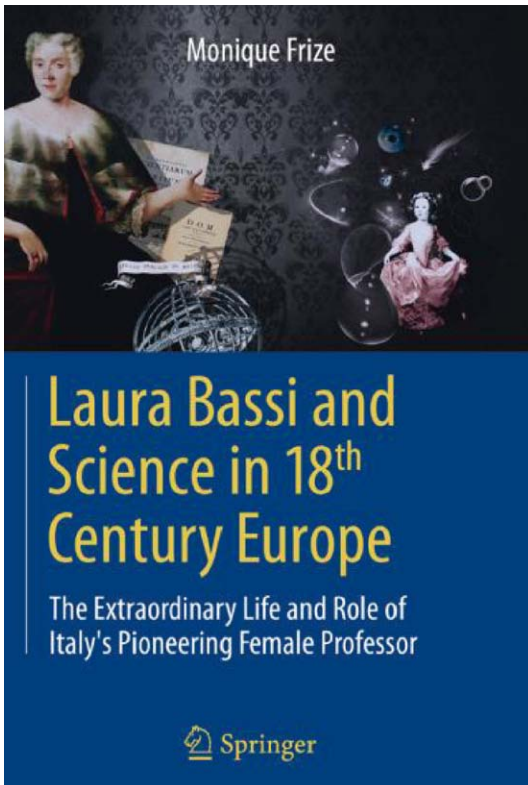
FEATURE COLUMN: BME in Europe



WISE



A new book by Monique Frize



Monique Frize, Ottawa, Canada

Laura Bassi and Science in 18th Century Europe

The Extraordinary Life and Role of Italy's Pioneering Female Professor

▲ **Written by Monique Frize, Distinguished Research Professor, Carleton University and Professor Emerita, University of Ottawa**

▲ **Tells the inspirational story of the first woman appointed as Professor in Europe**
▲ **Biography of general interest about a woman who forged a life time career and professional life in science in 18th century Italy**

This book presents the extraordinary story of a Bolognese woman of the settecento. Laura Maria Caterina Bassi(1711-1778)defended 49 Theses at the University of Bologna on April 17, 1732 and was awarded a doctoral degree on May 12 of the same year. Three weeks before her defense, she was made a member of the Academy of Sciences in Bologna.On June 27 she defended 12 additional Theses. Several of the 61 Theses were on physics and other science topics.Laura was drawn by the philosophy of Newton at a time when most scientists in Europe were still focused on Descartes and Galen. This last set of Theses was to encourage the University of Bologna to provide a lectureship to Laura, which they did on October 29, 1732. Although quite famous in her days, Laura Bassi is unfortunately not remembered much today.

This book presents Bassi within the context



FEATURE COLUMN: BME in Europe

of the century when she lived and worked, an era where no women could attend university anywhere in the world, and even less become a professor or a member of an academy. Laura was appointed to the Chair of experimental physics in 1776 until her death. Her story is an amazing one. Laura was a mother, a wife and a good scientist for over 30 years. She made the transition from the old science to the new very early on in her career. Her work was centered on real problems that the City of Bologna needed to solve. It was an exciting time of discovery and she was at the edge of it all the way.

Table of Contents:

An Extraordinary Event in 1732. - " Querelle des femmes" and Debates on the " Woman Question" . - Women in Science and Medicine in Europe Prior to the Eighteenth Century. - Laura Bassi: Her Education and Her Marriage. - The Slow Start of Laura Bassi' s Scientific Career and the Bolognese Community' s Response to her Work. - A Transition from the "Old" to the New Science. -Scientific Works by Laura Bassi and Giuseppe Veratti. - Laura Bassi and her Networks (1732-1745) . - Correspondence with Men in Science and

Medicine(1746-1778). - Famous Women in Science in Laura Bassi' s Epoch. - After Laura Bassi: Women in Science and Health careers in Nineteenth Century Italy.

ISBN : 978- 3- 642- 38684- 8

Due : June 30, 2013



COMING EVENT

MEDI TECH
2014, 5-7 June
4th edition
Cluj-Napoca, Romania

4th International Conference
on Advancements of Medicine
and Health Care
through Technology

TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA

Facultatea de Inginerie Electrică

IEEE ROMANIAN SECTION

EMB

IFMBE

MEDI TECH

5
JUNE 2014
7

CALL FOR PAPERS

All submitted papers should be in MS Word (.doc) format and Adobe Acrobat (.pdf) format and should be limited either to four or six pages, including figures, tables and references.

Detailed instructions on format and submission of papers will be found at www.meditech.utcluj.ro

IMPORTANT DATES

Deadline for receipt of full papers: **20 December 2013**.
Notification of paper acceptance: **1 March 2014**.

An up-to date programme will be made available at:

www.meditech.utcluj.ro



MEDI TECH
5 - 7 June 2014 | Cluj-Napoca | Romania

Medical Imaging, Image and Signal Processing

- Ultrasound Imaging
- Magnetic Resonance Imaging
- Data and Signal Processing
- Medical Image Processing
- Computed Tomography
- Nuclear Medicine

Modelling and Simulation

- Biomedical Computing
- Electromagnetic Field Simulation
- Biological Effects of Electromagnetic Field
- Hemodynamics



COMING EVENT

5 - 7 JUNE 2014
CLUJ-NAPOCA, ROMANIA

THE LOCATION

The Technical University of Cluj-Napoca is located in the historical center of Cluj-Napoca, the European Youth Capital (2015).



With one of the most vibrant economies in the country and a population of around 330.000, Cluj-Napoca is today a dynamic cultural and educational city. The six state and several private universities located here also make Cluj Napoca the city with the largest percentage of student population in Romania.

Molecular Bioengineering

Bio-nanotechnology
Drug Delivery and Pharmacokinetics
Molecular and Cellular Engineering
Tissue Engineering
Bioinformatics

Biomechanics

Biomaterials
Biomechanics of movement
Biomechanics and orthopedics
Cardiovascular mechanics

www.meditech.utcluj.ro | MEDITECH 2014

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MEDITECH 2014 The Conference

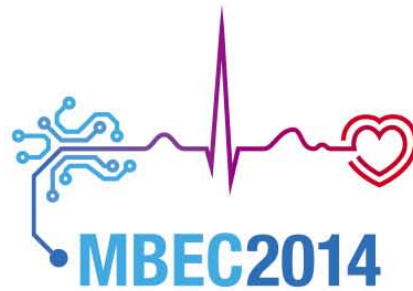
It is with great pleasure that the Technical University of Cluj-Napoca, welcome you to Cluj-Napoca to participate at the 4th International Conference on Advancements of Medicine and Health Care through Technology - MEDITECH2014, from June the 05th to June the 7th, 2014.

We would like MedTech 2014 to be a prestigious international event, which all participants remember fondly, however, we are aware that only your participation and involvement can ensure this.

The Meditech 2014 conference aims to provide a special opportunity for the scientists to exchange their know-how and build up collaboration in one of the most human field of science and technologies.

Partners

Contact: meditech@et.utcluj.ro | www.meditech.utcluj.ro



**6th European Conference
of the International Federation for
Medical and Biological Engineering**

**7-11 September 2014
Dubrovnik, Croatia**

- BIOMEDICAL SIGNAL PROCESSING
- BIOMEDICAL IMAGING AND IMAGE PROCESSING
- BIOSENSORS AND BIOINSTRUMENTATION
- BIO-MICRO/NANO TECHNOLOGIES
- BIOMATERIALS
- BIOMECHANICS, ROBOTICS AND MINIMALLY INVASIVE SURGERY
- CARDIOVASCULAR, RESPIRATORY AND ENDOCRINE SYSTEMS ENGINEERING
- NEURAL AND REHABILITATION ENGINEERING
- MOLECULAR, CELLULAR AND TISSUE ENGINEERING
- BIOINFORMATICS AND COMPUTATIONAL BIOLOGY
- CLINICAL ENGINEERING AND HEALTH TECHNOLOGY ASSESSMENT
- HEALTH INFORMATICS, E-HEALTH AND TELEMEDICINE
- BIOMEDICAL ENGINEERING EDUCATION

MBEC2014

<http://www.mbec2014-ifmbe.org>

*Towards new horizons in
biomedical engineering*



Croatian Medical
and Biological
Engineering Society



IFMBE



European Alliance for
EAMBES
Medical and Biological Engineering & Science





Welcome to Tainan, Taiwan
and welcome to the

9th Asian-Pacific Conference on Medical and Biological Engineering (APCMBE 2014)

Oct. 9-12, 2014

The 9th Asian-Pacific Conference on Medical and Biological Engineering (APCMBE 2014) will be held in Tainan, Taiwan at National Cheng Kung University from October 9 to 12, 2014. The Taiwanese Society of Biomedical Engineering (TSBME) is privileged to organize this international conference affiliated with International Federation on Medical and Biological Engineering (IFMBE). The TSBME has continuously held the Annual Conference on Biomedical Engineering and Technologies (ACBET) in Taiwan since its founding in 1980. Each year, the ACBET has attracted over 1000 attendees. To further internationalize the ACBET, TSBME will commence the first biennial Global Conference on Biomedical Engineering and Technology (1st GCBMET) jointly with APCMBE 2014. It is our great hope that this joint conference will bring more closely together the researchers, students, and communities around the world in order to share their latest research works and innovative developments in biomedical engineering (BME).

Tainan is the oldest city in Taiwan. This city is full of Taiwanese culture and heritage and is especially famous for historical architecture and local delicacies. Previously, Taiwan was known to the Portuguese as *Ilha Formosa* which means "beautiful island." Therefore, in addition to gathering with academic researchers and scholars, we hope all attendees will have the opportunity to enjoy an island hiatus with beautiful beaches, mountains, cultural events and foods. Welcome to Tainan and welcome to APCMBE 2014.



Fong-Chin Su, General Chair
Shyh-Hau Wang, Secretary General
Ming-Long Yeh, Vice Secretary General

Conference Dates: October 9 - 12, 2014
Conference Venue: National Cheng Kung University,
Tainan, TAIWAN

Language: English
Website: <http://conf.ncku.edu.tw/apcmb9/>




Contact


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TEL: +886-6-2760665
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Host Institutions

-  Taiwanese Society of Biomedical Engineering
-  Medical Device Innovation Center,
National Cheng Kung University
-  Department of Biomedical Engineering,
National Cheng Kung University

Supporting Institution

-  National Cheng Kung University

Sponsors

- Ministry of Education, TAIWAN
- National Science Council, TAIWAN

APCMBE 2014 is an international conference affiliated with IFMBE 



COMING EVENT

VI Latin American Conference on Biomedical Engineering CLAIB 2014

Paraná, Entre Ríos, Argentina 29, 30 & 31 October 2014

<http://bioingenieria.edu.ar/eventos/claib2014/en/>



The Organizing Committee, representing the Regional Council of Biomedical Engineering for Latin America (CORAL), is pleased to invite the Latin American and international scientific community to participate in the VI Latin American Conference on Biomedical Engineering (CLAIB2014).

This event, held since 1998, will have its next edition in Paraná, Entre Ríos, Argentina.

American Conferences on Biomedical Engineering are sponsored by the International Federation for Medical and Biological Engineering (IFMBE), the Society for Engineering in Medicine and Biology (EMBS) and the Pan American Health Organization and the

World Health Organization (PAHO-WHO), among other international organizations and agencies. The American Conferences on Biomedical Engineering bring together scientists, academics and biomedical engineers in Latin America and other continents in an environment conducive to the exchange and academic and professional growth.

CLAIB2014 provide forum to present research findings, share experiences and coordinate activities between institutions and universities in the region to develop Bioengineering, Biomedical Engineering and related sciences.

Previous meetings were held in Mazatlan (Mexico) in 1998, Havana (Cuba) in 2001; Joao Pessoa (Brazil) in 2004, Margarita Island (Venezuela) in 2007 and Havana (Cuba) in 2011.

The Conference program will be designed so as to cover topics of regional and international interest and to meet scientific expectations .





COMING EVENT

World Congress 2015 Update

We are looking forward to welcoming you to the 2015 World Congress which will be taking place in spectacular Toronto from June 7th to June 12th.

-The congress will be chaired by Dr. David Jaffray of the Canadian Organization of Medical Physicists (COMP) and Dr. Tony Easty of the Canadian Medical and Biological Engineering Society (CMBES).

-The organizing committee has been working hard to lay the groundwork for an outstanding congress and as we get closer to June 2015, activity is ramping up.

-We have secured the services of International Conference Services (ICS) who will be providing professional congress organization services. ICS has many years of experience organizing very successful events all over the world and we are pleased to be partnering with them to deliver a successful congress.

-We are hoping to welcome 4000 participants to the World Congress from North America, Europe, Asia, South America, Africa and Australia.

- The committee chairs have been appointed and represent a cross-section of experience to support the Congress as the world's leading forum for presenting current scientific work in health-related physics and technologies to an international audience. As a major event for science, medicine and technology, the Congress provides a comprehensive overview and in-depth, first-hand information on new developments, advanced technologies and current and future applications.

-The Congress will be comprised of six (6) days of courses, plenaries and scientific sessions for a total of over 400 sessions, with the space and preliminary program accommodating up to 20 concurrent sessions.

-The scientific and continuing education sessions as well as the extensive social program will provide you with opportunities for professional development and interaction with colleagues from around the world and a chance to discover and enjoy the beautiful city of Toronto.

-We look forward to seeing you in 2015!

