The Hosts

IUPESM – www.iupesm.org
The International Union for Physical and Engineering Sciences in Medicine, incorporating the IFMBE and the IOMP, represents more than 140,000 biomedical engineers and medical physicists and operates under the principal objective to advance sciences in medicine for the benefit and well-being of humanity.

IOMP – www.iomp.org
The International Organization for Medical Physics represents over 16,500 medical physicists worldwide and 76 national member organizations.

IFMBE – www.ifmbe.org
The International Federation for Medical and Biological Engineering is primarily a federation of national and transnational organizations. The Federation has an estimated 120,000 members in 58 affiliated organizations.

DGMP – www.dgmp.de
The German Society for Medical Physics (DGMP) was founded in 1969 and represents about 1,200 members working in science, industry and hospitals. Several regional sections of the Society have been established in recent years to improve communication channels among medical physicists in Germany and to support educational measures.

DGBMT – www.dgbmt.de
German scientists in the field of biomedical engineering are organized in the DGBMT, which was founded in 1972. The Society merged with the VDE in 2001 and now has about 1,900 members including physicians, engineers, scientists and companies.

EFOMP – www.efomp.org
The European Federation of Organizations in Medical Physics (EFOMP) was founded in 1980. The current membership covers 35 national organizations which together represent more than 5,000 physicists and engineers in the field of medical physics.

VDE – www.vde.com
The VDE Association for Electrical, Electronic & Information Technologies currently has over 34,000 members, including a broad spectrum of engineers, scientists and technicians, some 7,000 students and roughly 1,250 corporate and institutional members.

www.wc2009.org

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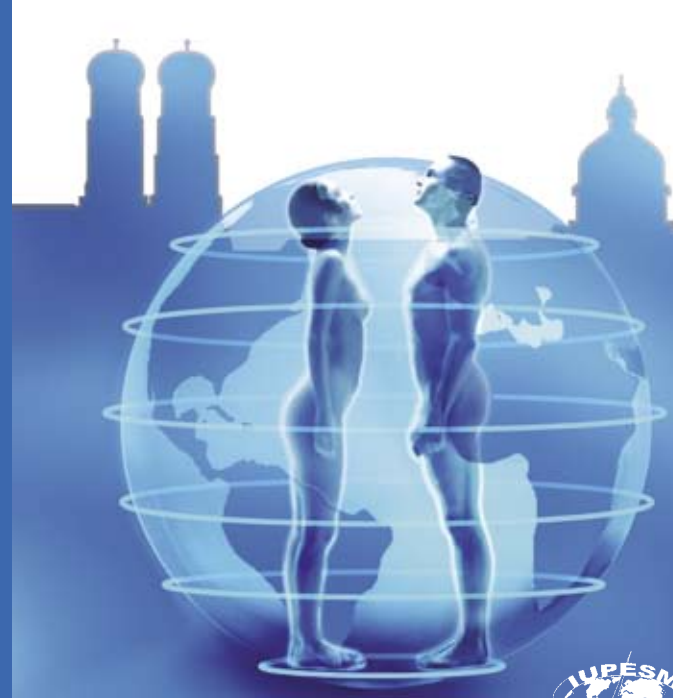
2nd Call for Papers

11th International Congress of the IUPESM

MEDICAL PHYSICS AND BIOMEDICAL ENGINEERING

WORLD CONGRESS 2009

For the benefit of the Patient.



September 7–12
Munich/Germany

IUPESM IOMP IFMBE

IOMP

IFMBE

DGMP

EFOMP

VDE | DGBMT
Deutsche Gesellschaft für Biomedizinische Technik im VDE

Contents

Present your research to the world!

The World Congress 2009 on Medical Physics and Biomedical Engineering – the triennial scientific meeting of the IUPESM – being held in Munich, Germany, on September 7 – 12, 2009, is the world's leading forum for presenting the results of current scientific work in health-related technologies to an international audience. We would like to invite you to participate in this outstanding scientific event – and to present your research to the world!

Wolfgang Schlegel

Olaf Dössel

Medical physics, biomedical engineering and bioengineering have been the driving forces of innovation and progress in medicine and healthcare over the past two decades. As new key technologies arise with significant potential to open new options in diagnostics and therapeutics, it is a multidisciplinary task to evaluate their benefit for medicine and healthcare with respect to the quality of performance and therapeutic output.

Covering key aspects such as information and communication technologies, micro- and nanosystems, optics and biotechnology, the congress will serve as an inter- and multidisciplinary platform that brings together people from basic research, R&D, industry and medical application to discuss these issues.

As a major event for science, medicine and technology held every three years, the congress provides a comprehensive overview and in–depth, first-hand information on new developments, advanced technologies and current and future applications. More than 4,000 visitors are expected to attend the congress in Munich.

With this 2nd Call for Papers, we are inviting you to present your research to the global community of leading experts and contribute to the further development of one of the most dynamic and innovative areas in modern science. Be a part of the future – and submit your papers!

Wolfgang Schlegel
Congress President

Olaf Dössel
Congress President

Advance our professions and global health!

Joachim Nagel

Since the first World Congress on Medical Physics and Biomedical Engineering convened in 1982, medically and biologically oriented engineers and physicists from every continent have gathered every three years to discuss how physics and engineering can advance medicine, health and health care and to assess the clinical, scientific, and technical progress in their fields. In the tradition and the mission of our professions, which are the only ones involved in the whole loop of health and health care from basic research to the development, assessment, production, management and application of medical technologies, the theme of WC 2009 is ''For the Benefit of the Patient''. Thus, in addition to scientific aspects, the Congress will focus on all aspects of safe and efficient health technology in both industrialized and developing countries, including economic issues, the perspectives that advanced technologies and innovations in medicine and healthcare offer for the patients and the development of societies, the progress of Medical Bioengineering and Medical Physics, including health policy and educational issues as well as the need for the regulation as health professionals of those biomedical/clinical engineers and medical physicists who are working in the health care systems.

The World Congress, bringing together physicists, engineers and physicians from all over the world, including the delegates of the 138 constituent organizations of the IUPESM representing some 140,000 individual members, is the best place to discuss these issues. I invite you to participate and to submit your papers regarding these topics – in addition to your scientific papers from all fields of medical & biological engineering and medical physics.

Even if you do not intend to submit a paper, still mark your calendar. The World Congress, as the most important event of our professions, provides the best possible opportunity for discussions, to meet old friends and to make new ones. I am looking forward to seeing you in Munich.

Joachim H. Nagel
President of the IUPESM

Host societies

International Organization for Medical Physics (IOMP), host of the World Congress 2009 and the 17th International Conference on Medical Physics of the IOMP incorporated in the World Congress 2009.

Barry Allen,
President IOMP

International Federation for Medical and Biological Engineering (IFMBE), host of the World Congress 2009 and the 22nd International Congress on Biological and Medical Engineering of the IFMBE incorporated in the World Congress 2009.

Makoto Kikuchi,
President IFMBE

German Society for Medical Physics (DGMP), host of the World Congress 2009 and the 40th Annual Meeting of the DGMP incorporated in the World Congress 2009.

Sibylle Ziegler,
President DGMP

European Federation of Organizations in Medical Physics (EFOMP), host of the 3rd Euopean Conference on Medical Physics of the EFOMP incorporated in the World Congress 2009.

Wolfgang Schlegel,
President EFOMP

German Society for Biomedical Engineering within VDE (DGBMT), host of the World Congress 2009 and the 43rd Annual Conference of the DGBMT incorporated in the World Congress 2009.

Hartmut Gehring,
President DGBMT

The vision of WC2009

The primary aim of the WC2009 is to offer a unique opportunity to exchange information and explore synergies in research, development and applications of medical technologies. This forum honors the outstanding and growing importance of technological solutions for medicine and healthcare with respect to the quality and results of interdisciplinary diagnostics and therapeutics.

The future of medicine is a multidisciplinary task
In view of global demographic changes and the tremendous increase in chronic diseases, an inter- and multidisciplinary discussion is needed to address the question of how these challenges can be met, and what medical technologies can contribute. WC2009 is dedicated to this goal.

Advanced technologies offer new options for healthcare
New key technologies such as micro- and nanotechnology, bioengineering, biotechnology and optical technologies offer promising options for medicine and healthcare. The congress will focus on exploring how these technologies could trigger innovations and provide new applications that help solve major health threats.

Industry meets science
Current state of the art in Science will help industry to efficiently work on tailored solutions for medicine. The close co-operation of both will be critical for the time innovation takes to come from ''bench to bed''. The WC2009 will provide numerous opportunities to initiate this co-operation – from personal exchange to common scientific projects.

WC2009: A platform for innovation in medical technologies
By bringing together professionals from the sciences, R&D and medicine, WC2009 provides a unique platform for discussing the role of new technologies and innovations in medicine. Exchanges like this will be a major driving force for future innovations.

Venue

Congress city
Munich – An ideal location
Few cities in the world offer such a fascinating mix of history, innovation, culture and recreation as Bavaria´s capital, Munich. With a population of over 1.3 million, the city combines delightful traditions with a dynamic and cosmopolitan flair, world-class cultural life and the unmatched attraction of nearby lakes, castles, Bavarian villages and the impressive Alps. With more than 4,000 high-tech companies and two university hospitals, Munich is one of Germany's most important technology centers. The city´s hotels are world-class and affordable, public infrastructure is one of the most efficient in the world, and the airport is one of Europe's most important and most attractive hubs.

Congress venue
The ICM (International Congress Center Munich) is one of the most modern congress centers in the world.

Scientific visits
The region is striving to consolidate its position as Europe's top biomedicine cluster. Numerous institutes, hospitals and companies can be visited.

Companion tours
Few other cities offer as many opportunities for cultural activities and historic sites as Munich. As a complement to the scientific program of the congress, there will be interesting opportunities for exploring the famous and exciting city and the nearby Alps.

Structure of the congress

To maximize synergies and the integration of themes on research, development and applications, the congress will be based on a unique structure that represents the two dimensions of technology and medicine.

13 congress themes on technology and innovation will be featured along with five medical topics representing some of the major future challenges for health professionals.

The themes will be chaired by leading experts from science and medicine. Specific aspects will be explored in depth.

Each theme will be divided into several tracks that will address specific aspects of medicine and technology. Overall there will be more than 100 tracks offering multiple and excellent opportunities for exchange.

1st day	2nd day	3rd day	4th day	5th day
08.09.2009	09.09.2009	10.09.2009	11.09.2009	12.09.2009
Oncology	Radiology & Nuclear medicine	Surgery & Intervention	Neurology, Neurosurgery, Rehabilitation	Cardiology, Cardiovascular diseases

1. Radiation Oncology
2. Diagnostic Imaging
3. Radiation Protection and Dosimetry, Biological Effects of Radiation
4. Image Processing, Biosignal Processing, Modelling and Simulation, Biomechanics
5. Information and Communication in Medicine, Telemedicine and e-Health
6. Surgery, Minimal Invasive Interventions, Endoscopy and Image Guided Therapy
7. Diagnostic and Therapeutic Instrumentation, Clinical Engineering
8. Micro- and Nanosystems in Medicine, Active Implants, Biosensors
9. Neuroengineering, Neural Systems, Rehabilitation and Prosthetics
10. Biomaterials, Cellular and Tissue Engineering, Artificial Organs
11. Biomedical Engineering for Audiology, Ophthalmology, Emergency & Dental Medicine
12. General Subjects
13. Special Topics and Workshops

Medical topics of the congress days

1st day: Oncology

Which improvements of diagnostic tools and therapeutic regimes offer promising perspectives for early detection and therapy for patients with oncological diseases?

2nd day: Radiology & Nuclear medicine

How will current and future advanced technologies contribute to the success of diagnostics and therapies in radiology and nuclear medicine?

3rd day: Surgery & Intervention

How could new materials and technologies for minimally invasive interventions revolutionize future therapies in surgery, implantation or intervention?

4th day: Neurology, Neurosurgery and Rehabilitation

How can new developments in diagnostic and functional imaging, surgery tools, prosthetics, neuroengineering or nano- and microsystems open up new options for the diagnosis and therapy of neurological diseases?

5th day: Cardiology & Cardiovascular diseases

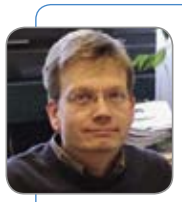
Interventional cardiology has had a major impact on the quality and results of the diagnosis and therapy of cardiovascular diseases, and has significantly lowered death rates. What's new on the horizon?

Also of interest

- Plenary sessions with leading experts as speakers
- Experts from medicine, technology and science will discuss future innovations and technological options
- More than 100 tracks focus on detailed topics
- Workshops & tutorials
- Mini-symposiums & special sessions
- Exhibition showcasing products and innovations
- Poster Exhibition, with special offers and sessions, will be an ideal platform for scientific networking

Theme 1

Radiation Oncology



Theme Chairs:

Thomas Bortfeld,
Massachusetts General Hospital
Boston, USA

Uwe Oelfke,
DKFZ German Cancer Research Center
Heidelberg, Germany

ABSTRACT:

Over the last decade, modern radiation oncology has made great advances through various new technical developments. Beginning in the mid-nineties with the clinical introduction of intensity modulated radiotherapy, the field of radiation oncology currently focuses on the integration of diagnostic imaging with traditional or new concepts of dose delivery devices. These developments have triggered new treatment strategies like image-guided and adaptive radiation therapy and will be extended by the inclusion of biological and functional images into the optimization of radiotherapy treatments. Another exciting development in radiation oncology in the last 5-10 years is the application of proton and heavy-ion beams for cancer treatment.

The establishment of these new technologies in radiation oncology has had a widespread influence on almost all aspects of medical physics. Traditional areas like treatment planning, patient immobilization, dosimetry, quality assurance and treatment verification have dramatically advanced to ensure the efficient, safe and reliable clinical application of novel hardware components. These dynamic changes in medical physics have also stimulated further innovative research in the field of brachytherapy, the application of biological models and patient outcome analysis.

All these exciting new developments will be covered by the 11 tracks of the theme Radiation Oncology at the World Congress 2009, which will pursue two major aims. First, it will provide a complete "state of the art" overview of the rapidly evolving field of medical physics and its application in current radiotherapy practice for all involved health care professionals. In addition, a series of keynote talks and invited speakers will identify and discuss the innovative new areas of research and development that likely will shape the more distant future of radiation oncology. We cordially invite the entire community of professionals involved in radiation oncology services to join these efforts at the WC2009 in Germany.

TRACKS:

Immobilisation, Positioning, Stereotaxy

Track Chairs:
Günther H. Hartmann,
DKFZ German Cancer Research Center,
Heidelberg, Germany

James M. Balter,
University of Michigan,
Ann Arbor, USA

Therapy Planning

Track Chairs:
Benedick A. Fraass,
University of Michigan,
Ann Arbor, USA

Simeon Nill,
DKFZ German Cancer Research Center,
Heidelberg, Germany

Optimization in Treatment Planning

Track Chairs:
Lei Xing,
Stanford University School of Medicine, USA

Anders Brahme,
Karolinska Institutet,
Stockholm, Sweden

IGRT*/Adaptive Radiotherapy

Track Chairs:
Marcel van Herk,
The Netherlands Cancer Institute,
Amsterdam, Netherlands

Daniel A. Low,
Washington University,
Saint Louis, USA

Dose Calculation Algorithms/ Monte-Carlo

Track Chairs:
Iwan Kawrakow,
INMS National Research Council of Canada,
Ottawa, Canada

Jeffrey V. Siebers,
Virginia Commonwealth University,
Richmond, USA

Advanced Beam Delivery

Track Chairs:
Steve Webb,
Royal Marsden NHS Foundation Trust,
Sutten, UK

Paul J. Keall,
Stanford University Cancer Center, USA

Hadron Therapy

Track Chairs:
Tony Lomax,
Paul Scherrer Institut,
Villigen, Switzerland

Radhe Mohan,
University of Texas,
Houston, USA

Dosimetry and Q/A**, Patient Safety

Track Chairs:
Ben J. Mijnheer,
The Netherlands Cancer Institute,
Amsterdam, Netherlands

Frank Verhaegen,
McGill University
Montreal, Canada

Brachytherapy

Track Chairs:
Christian Kirisits,
Medical University of Vienna, Austria

Dimos Baltas,
Klinikum Offenbach,
Germany

Jeffrey F. Williamson,
Virginia Commonwealth University Richmond, USA

Biological Models in Radiation Therapy

Track Chairs:
Sabine Levegrün,
University of Duisburg-Essen, Germany

N.N.

Biological/Functional Imaging in Radiation Therapy

Track Chairs:
Markus Alber,
University of Tübingen, Germany

Robert Jeraj,
University of Wisconsin
Madison, USA

*Image Guided Radiotherapy
**Quality Assurance

Theme 2

Diagnostic Imaging

Theme Chairs:

Willi Kalender,
Friedrich-Alexander-University Erlangen-Nuremberg
Institute of Medical Physics Erlangen, Germany

John Boone,
University of California Davis Medical Center
Sacramento, USA

ABSTRACT:

The Diagnostic Imaging theme will focus on cutting edge research and state-of-the-art clinical applications of diagnostic imaging procedures in humans and small animals. The modalities of interest include x-ray radiography and mammography, computed tomography, SPECT and PET imaging, molecular imaging, magnetic resonance imaging, ultrasound imaging, impedance tomography, bioelectric and biodynamic imaging, optical imaging techniques, and contrast agent development using traditional and nanotechnology methodologies. Scientific research involving these modalities in the areas of quantitative imaging, anatomical and physiological characterization, and image reconstruction will be covered.

The World Congress will provide a forum for imaging scientists from around the world to present the results of novel imaging technology development, assessment techniques for quantitative imaging, radiation dose metrics for procedures using ionizing radiation, multi-modality imaging and image fusion procedures, as well as research and clinical applications of these technologies. In addition to the focus on imaging technology, the congress will also emphasize applications in image-guided intervention and therapy. The focus here will be on the added benefit that imaging provides to therapeutic procedures. Leaders from the image science community from around the globe will participate as keynote and invited speakers.

TRACKS:

X-ray Imaging/ Mammography

Track Chairs:
Heinz-Otto Peitgen,
MeVis Research Center for Medical Image Computing, Bremen, Germany

John M. Boone,
UC Davis Medical Center, Sacramento, USA

Computed Tomography

Track Chairs:
Willi Kalender,
Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

Guang-Hong Chen,
The University of Wisconsin, Madison, USA

Magnetic Resonance Tomography

Track Chairs:
Jürgen Hennig,
University of Freiburg, Germany

Klaas Paul Prüssmann,
ETH Zurich, Switzerland

Ultrasound Imaging

Track Chairs:
Helmut Ermert,
Ruhr-Universität Bochum, Germany

Pai-Chi Li,
National Taiwan University, Taipei, Taiwan

SPECT* and PET**

Track Chairs:
Sibylle Ziegler,
Technical University of Munich, Germany

Habib Zaidi,
Geneva University Hospital, Switzerland

Molecular Imaging

Track Chairs:
Fabian Kiessling,
RWTH Aachen University, Germany

Vasilis Ntziachristos,
Technical University of Munich, Germany

Optical Imaging

Track Chairs:
Achim Langenbucher,
Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

William Frith Harris,
Johannesburg University, South Africa

Imaging Bioimpedance and Bioelectric Sources

Track Chairs:
Rob MacLeod,
University of Utah, Salt Lake City, USA

Olaf Dössel,
University of Karlsruhe (TH), Germany

Miscellaneous Topics

Track Chairs:
Willi Kalender,
Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

Charles A. Mistretta,
University of Wisconsin, Madison, USA

*Single Photon Emission Computed Tomography
** Positron-Emission Tomographie

Theme 3

Radiation Protection and Dosimetry, Biological Effects of Ionizing and Non-Ionizing Radiation

Theme Chairs:

Paul Shrimpton,
Health Protection Agency, UK

Gunnar Brix,
Federal Office for Radiation Protection, Germany

ABSTRACT:

Remarkable progress has been made over the past decades in the development and application of medical technologies utilizing ionizing and non-ionizing radiation for diagnosis and treatment of disease. The clinical use of these technologies, however, is accompanied by many questions about how to maximize the benefits for patients while controlling and reducing possible health risks to patients and personnel. These issues will be a central theme of the World Congress 2009. Six program tracks will focus on particular aspects of the theme, ranging from radiation dosimetry and new dosimetric models, through practical aspects of radiation protection, to biological effects of ionizing and non-ionizing radiation. Special topics will cover the expanding use of medical imaging techniques utilizing ionizing radiation for both patients and asymptomatic persons for the early detection of disease, the assessment of radiation risks at low dose-levels relevant to diagnostic imaging, the characterization and optimization of biological radiation effects for cancer treatment, as well as the investigation and assessment of health risks related to non-ionizing radiation. We are eager to receive contributions from a wide range of disciplines and approaches that are related to any of the featured tracks. The program will be supplemented by several keynotes and invited speakers from well-known scientists focusing on issues of particular relevance and importance in dosimetry, optimization and protection.

TRACKS:

Dosimetric Techniques and Phantoms for Radiation Protection

Track Chairs:
Georg Stücklschweiger,
University Hospital Graz, Austria

Maria Zankl,
German Research Center for Environmental Health, Munich, Germany

Radiation Protection of Patients and Personnel

Track Chairs:
Soren Mattsson,
Lund University, Malmö, Sweden

Werner Rühm,
German Research Center for Environmental Health, Munich, Germany

Patient Exposures and Reference Levels in Diagnostic Imaging

Track Chairs:
Jacob Geleijns,
Leiden University, Netherlands

Jürgen Griebel,
Federal Office for Radiation Protection, Germany

Biological Effects of Ionizing Radiation – Low Level and Imaging

Track Chairs:
David J. Brenner,
Columbia University, New York, USA

Christian Streffer,
University of Duisburg-Essen, Germany

Biological Effects of Ionizing Radiation – Therapy

Track Chairs:
Carsten Herskind,
University Medical Center Mannheim, University of Heidelberg, Mannheim, Germany

Michael Baumann,
OncoRay, Carl Gustav Carus University, Dresden, Germany

Biological Effects of Non-Ionizing Radiation

Track Chairs:
Rüdiger Matthes,
Federal Office for Radiation Protection, Germany

Theme 4

Image Processing, Biosignal Processing, Modelling and Simulation, Biomechanics

Theme Chairs:

Heinz Handels,
University Medical Center Hamburg-Eppendorf, Germany

Ron Kikinis,
Brigham & Women's Hospital, Boston, USA

ABSTRACT:

Theme 4 focuses on new methods and algorithms as well as recent developments and applications in the field of medical image computing. A variety of algorithmic, engineering and biomedical research topics will be covered. One of the areas is the development of models to improve image and signal processing techniques as well as the use of models for the simulation of dynamic processes in virtual bodies. Another topic is the combination of advanced image analysis and virtual reality systems for application in diagnostics, therapeutical applications and for education and training. A final area of interest to this track are modelling and simulation techniques in biomechanics and in the cardiovascular system.

The activities in theme 4 are intended as a forum for interdisciplinary exchanges among scientists, engineers and medical doctors. New diagnostic and therapeutic perspectives in this emerging field will be discussed to improve patient treatment in the future.

TRACKS:

Image Analysis and Visual Computing

Track Chairs:
Thorsten Buzug,
University of Lübeck, Germany

Carl-Fredrik Westin,
Harvard Medical School, Boston, USA

Image Segmentation and Registration

Track Chairs:
Til Aach,
RWTH Aachen University, Germany

Xavier Pennec,
Institut National de Recherche en Informatique et Automatique, Sophia Antipolis, France

Virtual Reality in Medicine

Track Chairs:
Nassir Navab,
Technical University Munich, Germany

Myong-Hee Kim,
Ewha Womans University, Seoul, Korea

Biosignal Processing

Track Chairs:
Hartmut Dickhaus,
University of Heidelberg, Germany

Luca Mainardi,
Politecnico di Milano, Italy

Modeling and Simulation

Track Chairs:
Heinz-Otto Peitgen,
University of Bremen, Germany

Garbor Szekely,
ETH Zurich, Switzerland

Computational Biology & Physiome

Track Chairs:
Nic Smith,
Oxford University, UK

Martyn Nash,
University of Auckland, New Zealand

Biomechanics

Track Chairs:
Klaus Radermacher,
RWTH Aachen University, Germany

Edoardo Mazza,
ETH Zurich, Switzerland

Flow in the Cardiovascular System

Track Chairs:
Dieter Liepsch,
University of Applied Sciences HAW, Munich, Germany

Hermann Berger,
Technical University Munich, Germany

Modeling and Analysis of the Cardiovascular System

Track Chairs:
Boudewijn Lelieveldt,
Leiden University Medical Center, Netherlands

Gunnar Seemann,
University of Karlsruhe (TH), Germany

Theme 5

Information and Communication in Medicine, Telemedicine and e-Health

Theme Chairs:

Heinz U. Lemke,
Technical University Berlin, University of Leipzig, Germany,
University of Southern California, USA

H.K. Huang,
University of Southern California,
Marina del Rey, USA

ABSTRACT:

One of the most distinguished features of information and communication technology (ICT) in medicine is the potential beneficial impact on quality and cost of healthcare. Administrative and management aspects can be effectively supported as well as diagnostic and therapeutic activities in medicine. Theme 5 focuses on a wide spectrum of relevant ICT technologies across healthcare applications with an emphasis on diagnosis and therapy based on images and other information sources.

TRACKS:

Image Processing, Display and Visualization

Track Chairs:
Andrew Todd Pokropek,
University College of London, UK

Hans Peter Meinzer, DKFZ German Cancer Research Center,
Heidelberg, Germany

Computer Aided Diagnosis

Track Chairs:
Kunio Doi,
University of Chicago Hospitals, USA

N.N.

Hospital-wide PACS*

Track Chairs:
Davide Caramella,
University of Pisa, Italy

Berthold B. Wein,
University Hospital Aachen, Germany

Surgical PACS

Track Chairs:
Osman M Ratib,
University Hospital of Geneva, Switzerland

Klaus Radermacher,
RWTH Aachen University, Germany

Standards: DICOM**, ISO, IHE***

Track Chairs:
Dewinder S. Bhachu,
St. George's Hospital, London, UK

Peter Mildenberger,
Clinical Center of the Johannes Gutenberg University of Mainz, Germany

Electronic Medical Record

Track Chairs:
Peter Waegemann,
Medical Record Institute, Newton, USA

Rolf Engelbrecht,
German Research Center for Environmental Health, Munich, Germany

Telemedicine

Track Chairs:
Bernard L. Crowe,
The Health Informatics Society of Australia, Canberra, Australia

N.N.

Digital Operating Room

Track Chairs:
H.K. Huang,
University of Southern California,
Marina del Rey, USA

Gero Strauss,
Clinical Center of the University of Leipzig, Germany

Workflow, Patient Specific Modeling

Track Chairs:
Pierre Jannin,
Université de Rennes, France

Heinz U. Lemke,
Technical University Berlin, University of Leipzig, Germany,
University of Southern California, USA

Strategies for Biomarker Selection

Track Chairs:
Olga Golubnitschaja,
University of Bonn, Germany

*Picture Archiving and Communication System
**Digital Imaging and Communications in Medicine
***Integrating the Healthcare Enterprise

Theme 6

Surgery, Minimal Invasive Interventions, Endoscopy and Image Guided Therapy

Theme Chairs:

Tim Lüth,
Technical University of Munich, Germany
Germany

Russell Taylor,
Johns Hopkins University
Baltimore, USA

ABSTRACT:

Computer-integrated systems and information-based technology is beginning to transform interventional medicine in the same way that they have transformed manufacturing and other sectors of our society. This transformation will enable clinicians to fundamentally improve patient care by:

- Exploiting technology to transcend human limitations in treating patients;
- Improving the safety, consistency, and overall quality of interventions;
- Improving the efficiency and cost-effectiveness of patient care; and
- Promoting more effective use of information at all levels, both in treating individual patients and in improving treatment processes.

The tracks within this theme address fundamental technical and systems issues that must be considered in order for these advantages to be achieved. Track 1 deals with image guided interventions based on models derived from preoperative and intra-operative medical imaging modalities, such as x-ray fluoroscopy, CT, MRI, and ultrasound. Track 2 covers new registration and navigation concepts associated with deforming anatomical structures such as liver, kidney, breast, lung, and associated blood vessels. Track 3 focuses on advances in video endoscopy, such as 3D imaging, multi-spectral imaging, high resolution and miniaturized sensors, and pill cams. Track 4 covers novel robotic devices, systems, and control concepts. Track 5 addresses specialized robots, tools, and applications emerging for minimally invasive surgery applications such as NOTES. Track 6 covers the important emerging technologies in lasers and interventional ultrasound.

TRACKS:

Image Guided Interventions

Track Chairs:
Kieran Murphy,
University of Toronto, Canada

Walter Kucharczyk,
University of Toronto, Canada

Soft Tissue and Vessel Based Navigation

Track Chairs:
Hans-Peter Meinzer,
DKFZ German Cancer Research Center, Heidelberg, Germany

Hans-Peter Bruch,
University of Lübeck, Germany

Endoscopy and Endoscopic Interventions

Track Chairs:
Klaus-Martin Irion,
Karl Storz GmbH & Co. KG Tuttlingen, Germany

Gero Strauss,
Clinical Center of the University of Leipzig, Germany

Robots and Manipulators in Therapy

Track Chairs:
Tim Lüth,
Technical University of Munich, Germany

Brian Davies,
Imperial College London, UK

Minimal Invasive Surgery and Instruments

Track Chairs:
Guang-Zhong Yang,
Imperial College London, UK

Lutz-Peter Nolte,
University of Bern, Switzerland

Laser and Ultrasound Interventions

Track Chairs:
Thomas Lennarz,
Medical University of Hannover, Germany

N.N

Catheter Interventions

Track Chairs:
Stefan Weber,
University of Bern, Switzerland

Bernhard Zrenner,
Medical Hospital, Landshut-Achdorf, Germany

Theme 7

Diagnostic and Therapeutic Instrumentation; Clinical Engineering

Theme Chairs:

André Dittmar,
Nanotechnologies Institute of Lyon, France

Jürgen Werner,
Ruhr-Universität Bochum, Germany

ABSTRACT:

Theme 7 focuses on new principles, ideas and applications involving all kinds of instrumentation for preventive, diagnostic and therapeutic control of the patient's physiological body functions. On the diagnostic side, a survey on the measurement of body signals will be presented, with particular stress on clinical monitoring, the acquisition of bioelectric and biomagnetic signals, and bioimpedance analysis. The spectrum of therapeutic intervention and instrumentation primarily comprises assistance, therapy or substitution of cardiovascular, renal, pulmonary, hepatic, pancreatic and other metabolic functions, as provided by instrumentation for cardiac, circulatory, respiratory and dialysis support, and by all types of injection, infusion, anaesthesia and sleep control systems. Specials tracks will focus on laser applications in medicine and topics of clinical engineering, such as the design, management and safety of clinical instruments and tools, and interactions within the patient/biomedical techniques/clinician system.

The theme offers a unique platform for exchanges on the latest developments in controlling and restoring vital body functions. Scientists, engineers, medical doctors and personnel, medical managers, as well as potential patients will profit from the interdisciplinary and authentic display of present and future developments in central and crucial topics of healthcare.

TRACKS:

Anaesthesia Systems

Track Chairs:
Guy Dumont,
University of British Columbia, Vancouver, Canada

Hartmut Gehring,
University Medical Center Schleswig-Holstein, Lübeck, Germany

Bioelectric & Biomagnetic Signals

Track Chairs:
Jens Haueisen,
Technical University Ilmenau, Germany

Arye Nehorai,
Washington University, St. Louis, USA

Bioimpedance

Track Chairs:
Steffen Leonhardt,
RWTH Aachen University, Germany

Hermann Scharfetter,
Graz University of Technology, Austria

Cardiovascular Systems

Track Chairs:
Yusuke Abe,
University of Tokyo, Japan

Thomas Schmitz-Rode,
RWTH Aachen University, Germany

Clinical Engineering

Track Chairs:
Tony Easty,
Toronto General Hospital, Canada

Uvo Hölscher,
Münster University of Applied Sciences, Germany

Heikki Teriö,
Karolinska University Hospital, Stockholm, Sweden

Dialysis & Apheresis Systems

Track Chairs:
Matthias Krämer,
Fresenius Biotech GmbH, Bad Homburg, Germany

Daniel Schneditz,
Medical University of Graz, Austria

Injection & Infusion Systems

Track Chairs:
Ewald Konecny,
University of Lübeck, Germany

Robert J. Kopotic,
Triage Wireless Inc., San Diego, USA

Lasers in Medicine

Track Chairs:
Serge Mordon,
Lille University Hospital, France

Hans-Dieter Reidenbach,
Cologne University of Applied Sciences, Germany

Monitoring

Track Chairs:
Michael Imhoff,
Ruhr-University Bochum, Germany

Joerg-Uwe Meyer,
Richard Wolf GmbH, Knittlingen, Germany

Pulmonary Systems

Track Chairs:
Marcelo Amato,
Universidade de São Paulo, Brazil

Steffen Leonhardt,
RWTH Aachen University, Germany

Sleep

Track Chairs:
Diane B. Boivin,
McGill University, Montreal, Canada

Thomas Penzel,
Charité, Berlin, Germany

Theme 8

Micro- and Nanosystems in Medicine, Active Implants, Biosensors

Theme Chairs:

Gerald Urban,
Albert-Ludwigs-University of Freiburg, Germany

Friedrich B. Prinz,
Stanford University, USA

ABSTRACT:

Micro- and nanosystem science has the potential to change life sciences and medical technologies by merging biological with micro technologies. The aim of this theme is to merge the two completely different scientific fields. Analytical and therapeutic micro- and nanosystems will be mandatory for system biologists and biomedical engineering in the long run, for gaining insight into morphology and the interactive processes of the living system.

New and personalized drugs can be developed leading to a revolution in life science supported by smart and sensitive micro-analytical tools, ultimately with single molecule sensitivity.

To date, micro-analytical devices have been used in clinical chemistry or in molecular biology as metabolic sensor arrays or gene chips. In addition, standard micro-biomedical products are primarily employed in intensive care and the surgical theater for monitoring purposes. The next generation of nanosystems will allow a deeper view into the function of cells, cell cultures, organs, and whole organisms.

The content of the theme goes beyond miniaturization to cover the use of innovative materials and biological substances in combination with micro-technological fabrication processes. These combined topics will yield completely new medical devices by intimately merging analytical and therapeutical methods in a process called ''theranostics''.

The scientific topics range from intelligent implant devices and drug delivery systems, to analytical micro-biosensors and arrays, complex DNA, protein and cell-based micro-systems. The emerging fields of bio-nano-technology will be highlighted. The target group of this theme includes engineers interested in the emerging field of micro-and nanoscience, medical doctors who are interested in the application of such devices, and biologists.

TRACKS:

Active Implants

Track Chairs:
Hans-Jürgen Wildau,
Biotronik,
Berlin, Germany

Hoc-Khiem Trieu,
Fraunhofer IMS,
Duisburg, Germany

Drug Delivery

Track Chairs:
Marc J. Madou,
University of California,
Irvine, USA

Jens Ducree,
Dublin City University,
Ireland

Nanobiosensors

Track Chairs:
Rainer Fasching,
University
Stanford, USA

Christine Kranz,
University of Ulm,
Germany

Nanoparticles/ Nanotheranostics

Track Chairs:
Andreas Jordan,
Magforce Nanotechnologies Inc.,
Berlin, Germany

Michael Krüger,
University of Freiburg,
Germany

Lab-on-Chip/ Biochips

Track Chairs:
Andreas Manz,
ISAS Institute for Analytical Sciences Dortmund,
Germany

Albert van den Berg,
Uni Twente,
Netherlands

On-Chip Cell Analysis

Track Chairs:
Bernhard Wolf,
Technical University of Munich, Germany

Alfred Stett,
University of Tübingen,
Germany

Theme 9

Neuroengineering, Neural Systems, Rehabilitation and Prosthetics

Theme Chairs:

Thomas Stieglitz,
IMTEK, Institute of Microsystem Technology University of Freiburg, Germany

Milos R. Popovic,
Institute of Biomaterials and Biomedical Engineering University of Toronto, Canada

ABSTRACT:

Theme 9 focuses on the emerging fields of neural engineering for replacing lost sensory or motor functions and on the latest developments of rehabilitation aids and robotics as well as on novel prosthetics that use intelligent embedded systems to adapt to a changing environment or even communicate with neural interfaces to receive control commands from the user.

The tracks will cover all relevant aspects in the interdisciplinary field ranging from models and simulations to investigate phenomena in the brain and develop models to explain the underlying principles of therapies, e.g. for deep brain stimulation to emerging technologies in neural interface and implant developments. Therapeutical applications will cover the fields of pain, epilepsy, Parkinson's disease and severe psychiatric disorders. Rehabilitation experts report from the latest studies to support stroke treatment by means of electrical stimulation and rehabilitation robotics. The use of electrical stimulation to help paralyzed persons in cycling and rowing also shows beneficial effects on secondary effects like ostheoporosis and ulcer prevention.

Sensory Neuroprostheses to restore vision in the blind are currently in human clinical trials. Can they really give back sight? You can discuss with the world leading groups their latest results within our track. Successful neural prostheses of the future will take advantage of neural control signals. The current state of peripheral nerve signal decoding and cutting- edge research from brain-computer interfaces offers insights about what performance can be expected for the first "thought control" devices in clinical practice. The theme will be a unique platform of information exchanges on the latest research results in the fields of rehabilitation and neural engineering. Natural scientists, engineers, medical doctors and potential patients will profit from the interdisciplinary presentations and discussions to restitute or replace functions or therapy diseases by interfacing with the nervous system or residual limbs.

TRACKS:

Innovative Orthotics and Prostheses for Amputees

Track Chairs:
Marc Kraft,
Technical University of Berlin, Germany

Hugh Herr,
MIT Massachusetts Institute of Technology, Cambridge, USA

Rehabilitation Robotics

Track Chairs:
Robert Riener,
ETH Zurich, Switzerland

David A. Brown,
Northwestern University, Chicago, USA

Vision Prostheses*

Track Chairs:
Eberhart Zrenner,
University of Tübingen, Germany

Joseph F. Rizzo III,
Harvard Medical School, Boston, USA

Brain Computer Interfaces

Track Chairs:
Nils Birbaumer,
University of Tübingen, Germany

Andrew Schwartz,
University of Pittsburgh, USA

Technologies for Neural Interfaces and Implants

Track Chairs:
Thomas Stieglitz,
University of Freiburg, Germany

Nick Donaldson,
University College of London, UK

Deep Brain Stimulation

Track Chairs:
Bart Nuttin,
University of Leuven, Belgium

Alim Louis Benabid,
CEA Minatec LETI, Grenoble, France

Modelling, Simulation and Control in Neural Engineering

Track Chairs:
Berj L. Bardakjian,
University of Toronto, Canada

Dominique M. Durand,
Case Western Reserve University, Cleveland, USA

Electrical Stimulation in Rehabilitation

Track Chairs:
Milos R. Popovic,
University of Toronto, Canada

N.N.

*cross-referenced with Ophthalmology I, theme 11

Theme 10

Biomaterials, Cellular and Tissue Engineering, Artificial Organs

Theme Chairs:

Andrea A. Robitzki,
Center for Biotechnology and Biomedicine University of Leipzig, Germany

Dietmar Hutmacher,
University of Technology Queensland, Australia

ABSTRACT:

Theme 10 focuses on cell and tissue engineering a rapidly expanding field which applies the principles and methods of biophysical sciences, life sciences and biomaterial engineering for understanding physiological as well as pathological systems for modifying and creating cells and tissues for therapeutical applications. Cellular and tissue engineering is a scientific theme used as tool to study virtually all of the physiological systems of the body as well as pathologies such as cancer, cardiovascular diseases, (neuro) degenerative diseases, genetic diseases, and infections. Moreover, some concepts of biomaterials, cellular and tissue engineering have resulted in both clinical and experimental therapies for tissue repair for skin, bone, cartilage, muscles, and blood vessels, for supporting and/or enhancing metabolic functions such as liver metabolism and detoxification, for improving and localizing drug delivery, and as a vehicle for cell-based gene therapy. Furthermore, tissue engineering utilizes a variety of approaches to regenerate tissues. These approaches can be characterized into three major groups. Biomaterials, without additional cells, are used to convey biological signals to surrounding tissues to recruit cells and promote inherent regeneration. Cells alone may be used, without scaffolds, to generate tissues. Finally, cells may be used with biomaterials as scaffolds acting as architectural frameworks for developing tissues. The technology focuses on the latter technique of developing and using biomaterial scaffolds for tissue engineering.

Theme 10 focuses on novel technologies in the field of nano-bioengineering that draws on synergies among engineers, physicians, and biomedical scientists to provide new interdisciplinary insights into medical and biological problems. The program offered in the tracks seek to emphasize the confluence of basic engineering with the physical and biological sciences, particularly in the areas of biomechanics, molecular cellular and tissue engineering, biomedical imaging and monitoring e.g. biophotonics and cytometry.

TRACKS:

Cytomics in High-Content Diagnosis

Track Chairs:
Attila Tarnok,
Herzzentrum Leipzig, Germany

J. Paul Robinson,
Purdue University, West Lafayette, USA

Active and Passive Biomechanics of Cells

Track Chairs:
Josef Alfons Käs,
University of Leipzig, Germany

Jochen Guck,
University of Cambridge, UK

Cell and Tissue Barriers As Targets and Tools For Advanced Drug Delivery

Track Chairs:
Claus Michael Lehr,
Saarland University, Saarbruecken, Germany

Justin Hanes,
The Johns Hopkins University, Baltimore, USA

Current Advances in Stem Cell Biology

Track Chairs:
Martin Zenke,
RWTH Aachen University, Germany

N.N.

Biomedical Imaging in TE/RM*

Track Chairs:
Georg N. Duda,
Charité, Berlin, Germany

Robert E. Guldberg,
Georgia Institute of Technology, Atlanta, USA

TE/RM* from a Translational Research and Clinical Point of View

Track Chairs:
Michael Sittinger,
Charité, Berlin, Germany

Jan-Thorsten Schantz,
Technical University of Munich, Germany
National University of Singapore

Nanotechnology in TE/RM*

Track Chairs:
Daniel Müller,
Biotechnology Center Dresden, Germany

Kevin Shakesheff,
University of Nottingham, UK

Scaffold Based TE/RM*

Track Chairs:
Carsten Werner,
Leipniz Institute for Polymere Research, Dresden, Germany

Michael Raghunath,
National University of Singapore

*Tissue Engineering/Regenerative Medicine

Theme 11

Biomedical Engineering for Audiology, Ophthalmology, Emergency and Dental Medicine

Theme Chairs:

Birger Kollmeier,
University of Oldenburg, Germany

Alfredo Ruggeri,
University of Padova, Italy

ABSTRACT:

The wide thematic richness of medical physics and biomedical engineering with respect to neurosensory systems (i.e., hearing and vision) and other medical problems related to the human head (i.e., dental medicine, emergency medicine) is highlighted in the current theme. Even though neurosensory stimulators have brought about a revolution in audiology (i.e., recent cochlear implants that can restore basic auditory functions in bilaterally deaf patients) and a substantial progress in ophthalmology is foreseeable (i.e., retina implants on the edge of being used in patients), a large number of problems still exist in diagnostics, fitting and rehabilitation techniques in these areas. Also, our lack of knowledge on how these physiological and pathophysiological systems actually work requires the intensive collaboration between physicists, engineers and physicians. The truly interdisciplinary work in this area along with tracks on emergency and dental medicine will therefore be highlighted in 10 tracks with internationally well-known experts in these respective areas.

TRACKS:

Audiology I: Cochlear Function & Dysfunction and its Consequences for Diagnostics and Rehabilitation

Track Chairs:
Pim van Dijk,
University of Groningen, Netherlands

Thomas Janssen,
Technical University of Munich, Germany

Audiology II: Central Auditory (Dys)Functions as Revealed by the Auditory Profile and Auditory Models

Track Chairs:
Torsten Dau,
Technical University of Denmark, Lyngby, Denmark

Wouter A. Dreschler,
AMC Academisch Medisch Centrum, Amsterdam, Netherlands

Audiology III: Cochlear Implants

Track Chairs:
Thomas Lenarz,
Medical University of Hannover, Germany

Norbert Dillier,
University Hospital Zurich, Switzerland

Ophthalmology I: Artificial Vision and Neural Prosthesis in Ophthalmology*

Track Chairs:
Eberhart Zrenner,
University of Tübingen, Germany

Botond Roska,
Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland

Joseph F. Rizzo III,
Harvard Medical School, Boston, USA

Ophthalmology II: Advancement in Ophthalmic Instrumentation

Track Chairs:
Gisbert Richard,
University of Hamburg, Germany

Marie-José Tassignon,
University of Antwerp, Belgium

Ophthalmology III: Advancement in Ophthalmic Diagnostics

Track Chairs:
Michael Abràmoff,
University of Iowa, Iowa City, USA

Aljoscha S. Neubauer,
LMU Munich, Germany

Ophthalmology IV: Physics and Electrophysiology for Ophthalmology

Track Chairs:
Jong-Mo Seo,
Seoul National University, Korea

Robert Wilke,
University of Tübingen, Germany

Ophthalmology V: Retinal Image Analysis

Track Chairs:
Alfredo Ruggeri,
University of Padova, Italy

Xiaoyi Jiang,
University of Münster, Germany

Dental Medicine

Track Chairs:
Volker Rasche,
University of Ulm, Germany

Erich Hell,
Sirona Dental Systems GmbH, Bensheim, Germany

Joachim Zöller
University Hospital of Cologne, Germany

Emergency

Track Chairs:
Armin Bolz,
University of Karlsruhe (TH), Germany

Anton Amann,
Medical University of Innsbruck, Austria

*cross-referenced with Vision Prostheses, theme 9

Theme 12

General Subjects

Theme Chairs:

Joachim H. Nagel,
Institute of Biomedical Engineering, University of Stuttgart, Germany

Stelios Christofides,
Nicosia General Hospital, Cyprus

ABSTRACT:

Traditionally, IUPESM World Congresses have focused on science and thus did not call much attention to the important professional issues of Medical Physics and Biomedical/Clinical Engineering nor to the societal implications of the disciplines which are essential for the development and recognition of these professions and the professionals dedicating their work to the health and well-being of mankind as laid down in the statutes of our scientific and professional organizations. Due to the ever growing importance of these issues and the increasing political discussions about modern health technologies, especially with regard to the information technologies, World Congress 2009 strengthens the theme General Subjects in the attempt to steer the attention of the Congress participants towards the important topics of education and training, accreditation and certification, career development in biomedical engineering and physics, medical and care compunetics, health economics, and health technology assessment. The contributions of medical physics and biomedical/clinical engineering to medicine and health care with specific emphasis on patient and user safety and health care in developing countries will be discussed and the role and implications of the health technologies, including the economic consequences will be analyzed. A BIOMEDEA* workshop will round off the program.

* A project that aims at contributing to the realisation of the European Higher Education Area in Medical and Biological Engineering and Sciences for the benefit of the universities, the students and the European people

TRACKS:

Education and Training

Track Chairs:
Slavik Tabakov,
King's College Hospital, London, UK

Dick W. Slaaf,
Eindhoven University of Technology, Maastricht, Netherlands

John Denis Enderle,
University of Connecticut, Storrs, USA

Paolo Lago,
Ingegneria Clinica Policlinico San Matteo, Pavia, Italy

Accreditation and Certification

Track Chairs:
Frank R. Painter,
University Connecticut, Stores, USA

Lenka Lhotská,
Czech Technical University, Prague, Czech Republic

Per Ask,
Lingköping University, Lingköping, Sweden

Klemens Zink,
University of Applied Sciences Gießen-Friedberg, Germany

Career Development in Biomedical Engineering and Physics

Track Chairs:
Guruprasad Madhavan,
Binghamton University, USA

Luis Kun,
National Defense University, Washington, USA

Wolfgang Schreiber,
Clinical Center of the Johannes Gutenberg University of Mainz, Germany

Maria Siebes,
Academic Medical Center, Amsterdam, Netherlands

Health Technology and Patient Safety

Track Chairs:
Joachim Nagel,
University of Stuttgart, Germany

Andrei Issakov,
WHO, Geneva, Switzerland

Medical and Care Compunetics

Track Chairs:
Lodewijk Bos,
International Council on Medical and Care Compunetics, Utrecht, Netherlands

Yunkap Kwankam,
WHO, Geneva Switzerland

Health Technology Assessment and Economics

Track Chairs:
Jan Persson,
Center for Medical Technology Assessment, Linköping, Sweden

Heikki Teriö,
Karolinska University Hospital, Stockholm, Sweden

Andrei Issakov,
WHO, Geneva Switzerland

William Hendee,
Medical College of Wisconsin, Milwaukee, USA

Health Technology Management in Developing Countries

Track Chairs:
Heikki Teriö,
Karolinska University Hospital, Stockholm, Sweden

Andrei Issakov,
WHO, Geneva Switzerland

Barry Allen,
St. George Hospital, Melbourne, Australia

Technology Enhanced Education

Track Chairs:
Slavik Tabakov,
King's College Hospital, London, UK

Donald Frey,
Medical University of South Carolina Charleston, USA

Jaakko Malmivuo,
Ragnar Granit Institute, Tampere, Finland

Biomedical Engineering in Preventive Healthcare & Public Health

Track Chairs:
Luis Kun,
National Defense University, Washington, USA

Biomedical Physics Education for the Medical and Healthcare Professions and the General Public

Track Chairs:
Stelios Christofides, Nicosia General Hospital, Cyprus

Carmel J. Caruana, University of Malta, Msida, Malta

Theme 13

Special Topics & Workshops

Theme Chairs:

Fridtjof Nüsslin,
Klinikum r. d. Isar
Technical
University of
Munich, Germany

William Hendee,
Medical College of
Wisconsin,
Milwaukee, USA

ABSTRACT:

Theme 13 addresses research opportunities and challenges across a spectrum of topics in medical physics and biomedical engineering. These topics embrace a number of research frontiers that will impact the clinical applications of medical physics and biomedical engineering in the future.

One major emphasis of Theme 13 includes three intertwined tracks that are important to the worldwide integration of medical physics and biomedical engineering. Cost-effective technologies to improve human health and well-being are very important in developing countries. One limitation to the application of useful technologies is the lack of adequate numbers of properly trained personnel, and international organizations are attempting to address this need in a number of programs. Included in these programs are web-based educational platforms and modules to promote fast and efficient acquisition of knowledge and skills critical to the application of new technologies.

New methods to generate and analyze proton and ion beams are being explored in a number of research laboratories, and these methods will be critically examined in Theme 13. Also, the use of magnetic resonance to furnish 3D-temperature maps in hyperthermia combined with radiation leads to improved heat distributions in the target volumes of radiotherapy patients.

Progress in molecular imaging is yielding deeper insights into the tumor and tissue micro-environment and providing molecular fingerprints at cellular and tissue levels. This progress promises ultimately to provide greatly-improved treatment plans designed for individual patients. Three tracks in Theme 13 are dedicated to the cross-over from molecular biology to medical physics. Along this route small animal experiments become an important tool in translational research. New technologies of high-precision radiotherapy and biological imaging of small animals will be discussed.

TRACKS:

Cost Effective Technologies for Developing Countries

Track Chairs:
Barry Allen,
St. George Hospital,
Melbourne, Australia

Boris Rubinsky,
Hebrew University of
Jerusalem, Israel

IOMP Symposium: Research in Medical Physics

Track Chairs:
Natalka Suchowerska,
Royal Prince Alfred
Hospital, The University of
Sydney, Australia

Colin Orton,
Wayne State University,
Grosse Pointe, USA

Workshop: Writing & Reviewing Scientific Publications

Track Chairs:
Colin Orton,
Wayne State University,
Grosse Pointe, USA

Alun Beddoe
Queen Elizabeth Hospital,
Birmingham, UK

Laser Generated Photon & Particle Beams

Track Chairs:
Dietrich Habs,
LMU Munich, Germany

Chang-Ming Charlie Ma,
Fox Chase Cancer Center,
Philadelphia, USA

The Role of the Medical Physicist in Clinical Trials

Track Chairs:
Tomas Kron,
Peter MacCallum
Cancer Institute
Melbourne, Australia

Søren M. Bentzen,
University of Wisconsin
School of Medicine and
Public Health, Madison, USA

Measurement of Tumor & Tissue Micro-Environment

Track Chairs:
Peter Vaupel,
University of
Mainz, Germany

Michael Molls,
Technical University of
Munich, Germany

Hyperthermia

Track Chairs:
Gerard Van Rhoon,
Erasmus Medical Center,
Rotterdam, Netherlands

Peter Wust,
Charité,
Berlin, Germany

Small Animal Irradiation and Imaging Technologies

Track Chairs:
John Wong,
Johns Hopkins University,
Baltimore, USA

Fridtjof Nüsslin,
Technical University of
Munich, Germany

The Art of Scientific Visualization

Track Chairs:
Andrel Linnenbank,
University of
Amsterdam, Netherlands

Rob MacLeod,
University of Utah,
Salt Lake City, USA

IOMP & EFOMP Workshop: Nanoparticles in Cancer Therapy

Track Chairs:
Alberto Torresin,
Azienda Ospedale Niguarda,
Milano, Italy

Yao-Xiong Huang,
Jinan University
Guangzhou, China

Workshop: The Challenge and the Reward of Being an Entrepreneur in Medical Physics and Biomedical Engineering

Track Chairs:
William Hendee,
Medical College of
Wisconsin,
Milwaukee, USA

N.N.

IOMP & EFOMP Symposium: Education & Training in Medical Physics

Track Chairs:
Anchali Krisanachinda,
Chulalongkorn University,
Bangkok, Thailand

Stelios Christofides,
Nicosia General Hospital,
Cyprus

Medical Physics Research Programs and Initiatives in Europe

Track Chairs:
Alberto Del Guerra,
Universita di Pisa, Italy

Caridad Borras,
Washington, USA

Invitation for authors

The Scientific Committee of the World Congress 2009 invites you to submit your papers for consideration in the final program. Please use the theme- and track scheme (p. 10–36) in order to address the topic most suitable to you. Please note this does not guarantee that your paper will be grouped within this track in the final program.

Peer review process
Contributions will be peer reviewed and either presented as a poster or an oral paper within the scientific program.

Congress proceedings
After acceptance the final papers will be published in the IFMBE proceedings series by Springer Science+Business Media complete with ISSN reference. Proceedings of the congress on CD/DVD will be available when the World Congress 2009 opens.

Citations
Springer Science+Business Media will index all papers of the congress proceedings at SpringerLink, ISI proceedings, Google etc.

Paper submission
Papers of min 2 and max 4 pages are to be submitted via the congress website. Please visit www.wc2009.org and click on the ''Paper Submission'' button. Authors whose papers have been accepted will have the possibility to refine their papers for publishing in the congress proceedings.

Paper Submission (min 2, max 4 pages)
Closing Date: February 22, 2009, 12 midnight CET

For more information please click on www.wc2009.org

Important dates for authors

Oct	01	2008	1st call for participation ''WC2009 Innovation Award''
Dec	01	2008	Online registration opens
Dec	01	2008	Launch of online paper submission system
Feb	22	2009	Paper submission due (min 2, max 4 pages) 12 midnight CET
Mar	01	2009	2nd call for participation ''WC2009 Innovation Award''
Apr	03	2009	Paper acceptance notification
May	01	2009	Speakers registration due
May	01	2009	Early registration due
May	01	2009	Registration payment for authors due
May	15	2009	Short program available
Jun	15	2009	Final program available
Jul	15	2009	Deadline update paper
Sep	07	2009	Opening World Congress

Oral presentation or poster
Submitting authors have the option of choosing their presentation preference: oral or poster, but the Scientific Program Committee will make the final decision.

Copyright
Authors must accept the copyright conditions which will be given on the congress website.

Congress registration policy
According to the congress registration policy, each accepted WC2009 paper must have at least one registration attached to it before May 1st, 2009 in order to be included in the congress proceedings.

Registration

Participation is open to everyone interested in medical physics and biomedical engineering. Those wishing to attend the congress should fill in the registration form available at the end of November 2008 and return it to the congress organizer. Alternatively you can use our Online Registration System that will be available as of December 1, 2008 on www.wc2009.org

Payment

Payment for registration must be made in euros. Authors whose papers have been accepted have to pay their congress fees until May 1st, 2009 in order to be included in the congress progam/ proceedings.
The following methods of payment are accepted:
- By credit card authorisation
- Cash payment on-site in euros (€)

Visa/Letter of confirmation

Nationals from some countries may require a visa to enter Germany. Please check with the German Embassy in your country.
If documentation or a letter of confirmation is required, please contact the congress organizer in support of a visa application after having registered for the congress.

Cancellation

In the case of cancellation after August 10, 2009 or no show, no refund will be made. Proceedings (CD/DVD) will be sent to the registrant after the congress.

Badges

Delegates will receive badges and vouchers for the booked events. Participants are kindly requested to wear their badge throughout the congress, even at social events. Lost badges will not be replaced. A new registration will be mandatory.

Proceedings

All accepted papers will be published in the electronic proceedings (CD/DVD) and will be provided to the congress delegates.
Additional proceedings will be on sale during the congress (upon availability).

Supporting program at the WC2009

In addition to the challenging scientific sessions, we are also offering an appealing support program that presents valuable information on science, medicine and industry as well as welcome opportunities for recruiting, cultural activities and networking.

Recruiting – Planning the future!
The training and expertise of young professionals is the future of innovation! Many companies and scientific institutions offer an ideal environment for training skills and gaining expertise for tomorrow's medicine and technology. Various recruiting events at the congress will provide attractive opportunities for contacting and presenting offers.

Innovation at Night – WC2009 Innovation Award
The best thing that can happen is turning an idea into a technology that benefits healthcare! A jury of leading international experts will select premium ideas and innovations presented at the congress. The winners of the "WC2009 Innovation Award" will be presented at the Awards Ceremony "Innovation at Night" during the congress.

Opening Ceremony – A fabulous opening!
Top-level speakers from science, medicine, industry and politics will highlight the global importance of the key issues being covered at this international congress. The ceremony will be an outstanding event offering various opportunities for personal contacts and talks in exclusive surroundings.

VDE Forum – Shaping tomorrow's medicine
Since new key technologies are expected to make major contributions to the solution of future challenges for medicine, a comprehensive discussion of options on global healthcare systems has to begin today.
The VDE Forum will provide an excellent opportunity to discuss these issues with leading international experts from medicine, science, business and the fields of ethics and futurology.

Exhibition & Sponsorship
Non-profit and Commercial Exhibition

With more than 4,000 participants expected to attend, the WC2009 is a major platform for experts from all areas of medical technologies – such as engineering, sciences, medicine, and education.

Since the WC2009 not only addresses science and development, but professionals involved in medical applications for advanced technologies, the commercial exhibition provides an excellent opportunity for industry partners and non-profit organizations to present their products to these target groups.

The congress attendees are leaders and decision-makers in research, design, and applications of medical physics and biomedical technology, including physicians and radiologists.

Categories of the commercial exhibition:

1. Radiation Oncology
2. Diagnostic Imaging
3. Radiation Protection and Dosimetry, Biological Effects of Radiation
4. Image Processing, Biosignal Processing, Modelling and Simulation, Biomechanics
5. Information and Communication in Medicine, Telemedicine and e-Health
6. Surgery, Minimal Invasive Interventions, Endoscopy and Image Guided Therapy
7. Diagnostic and Therapeutic Instrumentation, Clinical Engineering
8. Micro- and Nanosystems in Medicine, Active Implants, Biosensors
9. Neuroengineering, Neural Systems, Rehabilitation and Prosthetics
10. Biomaterials, Cellular and Tissue Engineering, Artificial Organs
11. Biomedical Engineering for Audiology, Ophthalmology, Emergency & Dental Medicine
12. General Subjects
13. Special Topics and Workshops

In addition to providing exhibition space, we will offer you various opportunities to become a partner or sponsor of the WC2009. For detailed information on exhibition & sponsorship opportunities, please contact the exhibition & sponsorship organizer (see p. 43) or visit our Congress Website. www.wc2009.org

Congresses incorporated in the WC2009

17th International Conference on Medical Physics of IOMP (International Organization for Medical Physics)

22nd International Congress on Biological and Medical Engineering of IFMBE (International Federation for Medical and Biological Engineering)

3rd European Conference on Medical Physics held by the European Federation of Organizations in Medical Physics (EFOMP)

40th Annual Meeting of the German Society for Medical Physics (DGMP)

43rd Annual Conference of the German Society for Biomedical Engineering (DGBMT)

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General information

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wc2009@eurokongress.de

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Congress Venue

ICM– INTERNATIONAL CONGRESS CENTER MUNICH
A business center is on service daily from 9 a.m. to 5 p.m.
Phone, fax, internet access, printing services and WiFi access are available

ICM – Messe München GmbH
Messegelände
D-81823 München
www.icm-muenchen.de

Destination Munich
Welcome to Munich, often called ‚the city with a heart', which is Germany's most popular destination and has something to offer to everyone, from culture, high-tech and parks to nightlife, architecture, beer gardens or the nearby mountains and lakes.

Accommodations
A wide variety of hotel rooms in various categories has been reserved by our exhibition & sponsorship organizer. For more details please visit **www.wc2009.org**

Companion tours

Few cities provide as many opportunities for cultural activities and historic sites as Munich. In addition to the scientific program of the congress, there will be various offers and opportunities to explore the famous city and its attractive surroundings. **www.wc2009.org**

Congress language
All scientific sessions will be held in English. There will be no simultaneous translation.

Currency
The official currency in Germany is the euro (EUR). Standard credit cards (Mastercard, American Express, VISA) are accepted in hotels, department stores and restaurants. Currently (October 2008) the exchange rate is approx. 1 EUR = 1,47 USD

Electricity
Power supply is 230 V AC, 50 Hz

Insurance
The organizers may not be held responsible for any injury to participants or damage, theft and loss of personal belongings. Participants should therefore make their own insurance arrangements.

Shopping
Munich is an ideal city to go on a leisurely stroll through the shops, Viktualienmarkt, Kaufinger Strasse, Die Fünf Höfe just to name a few of them. For more details please visit **www.munich.de**

Time zone
GMT (UTC) +01:00

Transportation

By air:
The Munich Airport is the second largest international airport in Germany. It is located 28 km northeast of the city center and offers both bus and train connections. For details please see **www.munich-airport.de**.
Direct taxi rides from the airport to the ICM are offered at a fixed rate (51 € – October 2008).

By train:
The Main Train Station (Hauptbahnhof) is located in the center of Munich, only approximately 2 km from the central square (Marienplatz). More than 800 long-distance trains and regional trains arrive and depart every day. Connection to the ICM is via U 2 subway line (ca. 20 min) or by taxi.

By car:
If you travel to Munich by car, signs throughout the greater Munich area will guide you to the New Munich Trade Fair Center/ICM.

Detailed information on transportation will be provided in the final program and on the Congress Website.

Visa/Letter of confirmation
Nationals from some countries may require a visa to enter Germany. Please check with the German Embassy in your country. If documentation or a letter of confirmation is required, please contact the congress organizer for support of a visa application after having registered for the congress.

Weather
The weather in Munich in September is still beautiful and warm. However, there may be chilly and rainy days. The temperature can range between 10C° and 25C°. Please check the actual weather on **www.weather.com**

Program contents and dates may be subject to change.
Most recent information can be found on: www.wc2009.org

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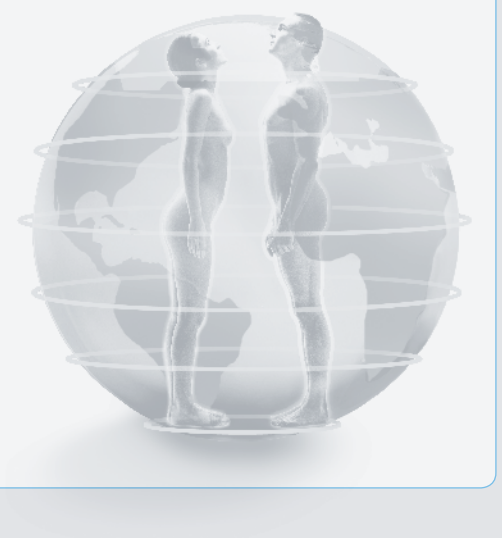

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