

BMT – Biomedical Technology/
Biomedical Engineering

PROGRAMME

BMT



2012

46th DGBMT ANNUAL CONFERENCE
September 16-19, 2012

JENA



September 16-19, 2012
Friedrich Schiller University Jena
University Campus
Carl-Zeiss-Straße 3, 07743 Jena
www.bmt2012.de



Friedrich-Schiller-University Jena

med
ways.

**Ernst-Abbe-Fachhochschule Jena**
Hochschule für angewandte Wissenschaften

**ILMENAU** UNIVERSITY OF
TECHNOLOGY

DGBMT GERMAN SOCIETY FOR BIOMEDICAL
ENGINEERING WITHIN VDE

VDE

Greeting of the Conference Chairmen and the Organizers



For the first time, three universities, Friedrich Schiller University Jena, Ilmenau University of Technology and Ernst Abbe University of Applied Sciences Jena, supported by their partner medways, the medical technology industry network, jointly host an annual conference of the German Society for Biomedical Engineering (DGBMT) within VDE. Basic research, applied research, clinical application and the expertise for the sustainable exploitation of scientific results as products and procedures for the global market are located in an outstanding manner in the university site of Jena.

Building on a longstanding tradition of co-operation between science and industry medical technology has established itself as a sound and sustainable sector in Thuringia. In addition to the global players it is the many young companies in the fields of medical chemical analysis, laser engineering, implant technology and medical instruments and devices which benefit from the excellent range of possibilities that are available at the site.

We would like to invite medical experts, engineers and scientists for an intensive and creative technical dialogue in this environment where the most recent scientific results will be discussed and tested for their suitability in practice. The annual conference will focus on maintaining existing contacts and initiating new co-operations as well as holding talks in a pleasant atmosphere.

We look forward to meeting you at the BMT 2012 – 46th annual conference of the German Society for Biomedical Engineering in Jena.

Prof. Dr. Jens Hauelsen (conference chair)
Prof. Dr. Andreas Voss (conference chair)
Prof. Dr. Herbert Witte (conference chair)



In Biomedical Engineering scientists, engineers, computer scientists and doctors cooperate in an interdisciplinary way. The annual conference of the German Society for Biomedical Engineering (DGBMT) within VDE is the ideal setting for this interdisciplinary cooperation. From 16 to 19 September 2012, the leading experts in the field of Biomedical Engineering at universities, research institutes and industrial companies meet at Friedrich Schiller University Jena to present the latest results in research and development, discuss recent trends in Biomedical Engineering and initiate new projects.

The 46th annual conference of the DGBMT has become the largest German language BMT conference offering a wide range of fields of medical technology. More than 550 conference papers and posters and 19 scientific tracks cover a wide range of topics in research and development. At this year's conference, focal topics are biosignal processing, implants, modelling and simulation as well as imaging. The programme is rounded off by special sessions, e.g. on intelligent implants, BMBF and EU sponsoring and the VDE MedTech Tutorial. As in the previous years, the BMT will once again be accompanied by the Young Forum BMT.

I wish us all a successful conference and a most enjoyable stay at the Friedrich Schiller University Jena.

Prof. Dr. med. Dipl.-Ing. Thomas Schmitz-Rode

Chairman of the German Society for Biomedical Engineering (DGBMT)
within VDE

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Organizers and Conference Venue



Conference Chairmen



German Society for Biomedical Engineering (DGBMT) within VDE

The DGBMT promotes co-operation between scientists, engineers and physicians in the fields of research, development, application and teaching. It supports the exchange of knowledge between various disciplines of biomedical technology and seeks to accelerate the transfer of new technologies into medical application.

► www.vde.com/dgbmt

Ernst Abbe University of Applied Sciences Jena

The largest university of applied sciences in Thuringia offers scientifically based and practice-oriented studies in eight departments of engineering, business administration and social sciences.

► www.fh-jena.de

Friedrich Schiller University Jena

Rich in tradition, Friedrich Schiller University Jena offers a wide range of more than 130 fields of study. There are programmes with different degrees as well as postgraduate programmes and continuing education.

► www.uni-jena.de

Ilmenau University of Technology

Ilmenau University of Technology is the only technical university in the Free State of Thuringia. Its profile covers technology, the sciences and medicine. Five departments offer students a future-oriented, interdisciplinary programme in the fields of engineering, mathematics and the sciences as well as economics and social sciences.

► www.tu-ilmenau.de

Conference venue

Friedrich Schiller University Jena
University Campus
Carl-Zeiss-Straße 3
07743 Jena

Jens Hauelsen

Institute Director and Chair of
Biomedical Engineering Group
Institute of Biomedical Engineering and
Informatics
Ilmenau University of Technology



Andreas Voss

Dept. Medical Engineering and
Biotechnology
Ernst Abbe University of Applied
Sciences Jena



Herbert Witte

Institute Director of Medical Statistics,
Computer Sciences
and Documentation (IMSID)
Friedrich Schiller University Hospital Jena





Conference Organizing Committee

Jens Haueisen, Ilmenau (conference chair)
Andreas Voss, Jena (conference chair)
Herbert Witte, Jena (conference chair)
Klaus Benndorf, Jena
Axel Brakhage, Jena
Hans-Reiner Figulla, Jena
Jürgen Popp, Jena
Konrad Reinhart, Jena
Cord Schlötterburg, Frankfurt
Thomas Stieglitz, Freiburg
Andreas Tünnermann, Jena
Gerald Urban, Freiburg
Otto W. Witte, Jena

Programme Committee

Karl-Jürgen Bär, Jena
Martin Braecklein, Waiblingen
Manfred Dick, Jena
Hartmut Dickhaus, Heidelberg
Olaf Dössel, Karlsruhe
Ben Fabry, Erlangen
Hartmut Gehring, Lübeck
Michael Gräf, Saalfeld
Orlando Guntinas-Lichius, Jena
Jens Haueisen, Ilmenau
Jörg Hauser, Bochum
Uvo Hölscher, Steinfurt
Thomas Hübner, Jena
Michael Imhoff, Bochum
André Kaeding, Ilmenau
Werner Korb, Leipzig
Marc Kraft, Berlin

Andreas Lauth, Zeulenroda
Heinz U. Lemke, Küssaberg
Thomas Lenarz, Hannover
Hagen Malberg, Dresden
Jörg-Uwe Meyer, Ratzeburg
Ute Morgenstern, Dresden
Wolfgang Niederlag, Dresden
Heinrich Martin Overhoff, Gelsenkirchen
Thomas Schanze, Gießen
Thomas Schauer, Berlin
Ekkehard Schleußner, Jena
Thomas Schmitz-Rode, Aachen
Werner Schwarze, Jena
Olaf Simanski, Wismar
Thomas Stieglitz, Freiburg
Gudrun Stockmanns, Krefeld
Olaf Such, Best
Lutz Trahms, Berlin
Gerald Urban, Freiburg
Peter van Leeuwen, Bochum
Andreas Voss, Jena
Niels Wessel, Berlin
Hans-Jürgen Wildau, Berlin
Herbert Witte, Jena
Thomas Wittenberg, Erlangen

Opening Ceremony, Greeting and Main Speech



17-09-2012, 19:00 – 20:30 h, Room HS1, ground floor

WELCOME SPEECHES OF THE CONFERENCE CHAIRMEN

WELCOME SPEECH

Prof. Dr. med. Dipl.-Ing.

Thomas Schmitz-Rode

Chairman of the German Society for Biomedical Engineering



WELCOME SPEECH

Prof. Dr. Thorsten Heinzel

Vice-Rector for Research of Friedrich Schiller University Jena



WELCOME SPEECH

Prof. Dr. Thomas Deufel

State Secretary of the Thuringian Ministry of Education, Science and Culture



WELCOME SPEECH

Frank Schenker

Mayor of Jena



WELCOME SPEECH

Dr. Arnulf Wulff

Landesentwicklungsgesellschaft Thüringen mbH (LEG Thüringen)



MAIN SPEECH

Prof. Dr. Klaus Dicke

Rector of Friedrich Schiller University Jena



AWARD CEREMONY

Klee-Prize

Prof. Dr. rer. nat. Olaf Dössel

Chairman of the Awards Committee



AWARD CEREMONY

Award for Patient Safety in Medical Technology

Prof. Dr.-Ing. Uvo Hölscher

Chairman of the Awards Committee



Music programme: cello quartet of the Faculty for Physics and Astronomy at Friedrich Schiller University Jena (under the direction of Prof. Dr. M. Kaluza)

18-09-2012, 20:30 – 22:30 h, Social Event at the Zeiss-Planetarium Jena

MAIN SPEECH

Matthias Machnig

Minister of the Thuringian Ministry of Economy, Employment and Technology



Keynotes



17-09-2012, 8:30 – 9:15 h, Room HS1, ground floor

KEYNOTE

In-vivo Human Molecular Imaging Using PET-MRI Fusion Imaging Technology

Prof. Dr. Zang-Hee Cho, Ph.D
Director of the Neuroscience Research Institute (NRI) of Gachon University of Medicine and Science, Republic of Korea



17-09-2012, 14:00 – 14:45 h, Room HS1, ground floor

KEYNOTE

Bioelectric environments for stem cell derived neurons and cardiomyocytes

Prof. Dr. Jari Hyttinen, Ph.D
Director of the Department of Biomedical Engineering, Tampere University of Technology, Tampere, Finland



18-09-2012, 8:30 – 09:15 h, Room HS1, ground floor

KEYNOTE

Information from Graphical Analysis of HRV

Prof. Dr. Phyllis K. Stein, Ph.D
Professor of Medicine, Division of Cardiology, Director of Heart Rate Variability Laboratory, Washington University School of Medicine, USA



18-09-2012, 14:00 – 14:45 h, Room HS1, ground floor

KEYNOTE

Perkutan implantierbare Herzklappen: Patientenfreundliche Therapie durch Medizintechnik

Prof. Dr. med. Hans-Reiner Figulla, MD
Clinic for Internal Medicine I, Jena University Hospital, Germany



19-09-2012, 8:30 – 9:15 h, Room HS1, ground floor

KEYNOTE

Strahlentherapie von Krebs mit laserbeschleunigten Ionen – eine Vision

Prof. Dr. Dr. h.c. Roland Sauerbrey
Scientific Director of the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Helmholtz Association of German Research Centres



19-09-2012, 11:30 – 12:15 h, Room HS1, ground floor

KEYNOTE

Optical coherence tomography – from research to routine medical diagnostics

Dr. Michael Kempe, Ph.D
Carl Zeiss AG Corporate Research & Technology, Jena



DGBMT Internal Events



16-09-2012, 13:00 – 14:00 h, Room SR113, first floor

DGBMT board meeting

16-09-2012, 14:00 – 18:00 h, Room SR113, first floor

DGBMT board and advisory council meeting

18-09-2012, 13:00 – 14:00 h, Room HS3, ground floor

DGBMT members' meeting

(Lunch bags will be provided in the conference room HS3)

Open Meetings of the DGBMT Technical Committees



The technical and scientific work of the German Society for Biomedical Engineering (DGBMT) within VDE is carried out by its **technical committees and working groups**.

Here,

- doctors, engineers and scientists from
- hospitals, research institutes and companies

cooperate interdisciplinary and transdisciplinary. Work contents range from

- the exchange of knowledge and networking to
- planning and implementing events and
- drawing up studies and position papers.

Guests are cordially invited:

Take the opportunity to participate in an intensive technical dialogue at the meetings of the DGBMT Technical Committees taking place during the BMT 2012 in Jena.

The **dates** for the meetings of the technical committees are listed in the current overview in your conference documents.

18-09-2012, 17:00 – 18:30 h, Room HS4, ground floor

VDE MedTech experts provide information about the latest trends in the fields of research, standardization, efficient hospitals as well as testing and certification.

The conference fee includes admission to the VDE MedTech Tutorial.

Programme:

Language: German

Chair & Moderation:

Cord Schlötelburg, DGBMT within VDE, Germany

17:00 **Biomedical Engineering in Germany: Competence, Technology Transfer, Financing**
Cord Schlötelburg, VDE, Germany

17:20 **News from Standardization: Alarms and Usability**
Klaus Neuder, VDE DKE, Germany

17:40 **Blues Hospital: Efficient, Quality Optimized and Energy Efficient Processes in Hospitals**
Johannes Dehm, VDE, Germany

18:00 **Certification of Processes: Sustainability and Software**
Michael Bothe, VDE Institute, Germany

18:20 **Discussion**

18:30 **End of session**

VDE, the Association for Electrical, Electronic & Information Technologies is one of the largest technical and scientific associations in Europe with more than 36,000 members. We are headquartered in Frankfurt am Main, and are represented in Berlin and Brussels as well as with 29 branch offices throughout Germany.

Biomedical Technology (BMT) / Biomedical Engineering is a key topic of the VDE commonly supported by the DGBMT, the DKE* and the VDE Testing and Certification Institute.

► www.vde.com

The German Society for Biomedical Engineering (**DGBMT** within VDE) works to promote the development and application of innovative medical technologies in the country's healthcare system to help patients, heal people and prevent disease. Physicians, scientists and engineers work closely together in the DGBMT to facilitate the cost-effective use of advanced technologies for diagnostics and therapy.

► www.vde.com/dgbmt

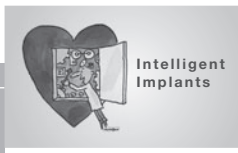
The **DKE** elaborates standards and specifications for medical devices and systems as well as safety relevant requirements for the protection of patients and users at an international level.

► www.dke.de

The **VDE Institute** is the "notified body" for active medical products according to the Medical Products Directive (93/42/EWG) and the Medical Devices Law (MPG). All tests and services relating to product safety, quality and usability make up the portfolio of the neutral and independent institute, including the certification and auditing of medical devices and systems as well as management systems in hospitals.

► www.vde-institut.com

*DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE



18-09-2012, 09:30-11:00 h, Room HS2, ground floor

Intelligent implants: Clinical research & approval

Programme:

Chairs:

Johannes Dehm, VDE, Germany

Cord Schlötelburg, DGBMT within VDE, Germany

- 09:30 **The technology navigator for intelligent implants – Yellow pages for developers**
Klaus-Peter Hoffmann, Fraunhofer Institute for Biomedical Engineering & IBMT, Germany
- 10:00 **Clinical trials with intelligent implants**
Xina Graehlert, Technical University of Dresden, Germany
- 10:30 **Approval of intelligent implants**
Hartmut Ritscher, TÜV Product Service GmbH, Germany

BMBF accompanying research on intelligent implants:

The German Society for Biomedical Engineering (DGBMT) within VDE coordinates the **BMBF (Federal Ministry of Education and Research)** sponsored accompanying research project “Intelligent Implants”, the purpose of which is to overcome obstacles to innovation on this subject faced by the 12 joint projects sponsored by the BMBF.

Intelligent implants are highly complex systems made up of sensors, actuators and signal processing. They have already become an indispensable part of modern therapy and are among the most demanding medical products at all. The funding measure comprises eight application-oriented cooperative projects coordinated by medical technology companies. In addition, four scientific projects are funded where central issues are examined in the development and enhancement of key components for implants. The DGBMT has published two position papers on “bio-implants” and “theranostic implants”. The position papers contain a comprehensive discussion of the state of the art, identify the need for faster translation into clinical application and give recommendations for action in order to improve the framework conditions for innovation.

Medical implants are a main topic at the “BMT” annual conferences of the DGBMT with a multitude of scientific papers.



16-09-2012 at 9:00 h, University Campus

The Young Forum BMT addresses its initiative to students, doctoral candidates and young professionals interested in Biomedical Engineering and cordially invites them to take part in an exchange of information.

9:00 – 11:30 h

Guided tour of the Institute of Photonic Technology (IPHT)

Meeting point: Albert-Einstein-Str. 9, 07745 Jena

13:00 – 15:00 h

Tutorial and Workshop

“Presenting and communicating – truly professional”

15:15 – 16:45 h

Panel Discussion

“Degree in BMT – what now?”

BMT graduates working in industry and science talk about their careers and discuss goals, experiences and career opportunities.

Starting 17:00 h

Get-together “Young Forum BMT 2012”

Participation fee: 15 € (including food)

Online registration: www.vde.com/youngbmt

17 to 19-09-2012, Trade exhibition

The Young Forum BMT will present itself together with the DGBMT within VDE and the VDE YoungNet at the trade exhibition of the 46th DGBMT annual conference. Get informed interactively about the opportunities for studying BMT and the requirements for BMT graduates.

17-09-2012, 15:00 – 16:30 h, Room HS5, ground floor

Session together with the expert committee “Training and further education - BMT in your studies”.

Young researchers discuss with experienced scientists on their practical experience.

A separate registration for the BMT 2012 is required for a visit to the exhibition and the participation in the conference programme.

Certification of the lecture programme of the BMT 2012 – 46th DGBMT annual conference is granted by the Medical Association of Thuringia based on the current further training regulations of the Medical Association and the uniform assessment criteria.

According to **category B**, the conference is certified as an all-day or half-day event with parallel parts of event.

The following number of further **training points (FP)** can be awarded per day of the event:

17-09-2012 – 6 FP

18-09-2012 – 6 FP

19-09-2012 – 6 FP

Registration numbers: 45796 - 45798

At the end of the respective conference day you will receive a **certificate of attendance** issued in your name.

The organizer is responsible for the transmission of uniform numbers of further training for participants to the electronic information distribution list.

Participants are requested to independently register the further training points (FP) with the Medical Association of Thuringia after the conference.

17 to 19-09-2012, Trade exhibition

The Cluster Medical Technology North Rhine-Westphalia (NRW) on the BMT 2012 in Jena

Since its start in August last year, the Cluster Medical Technology NRW puts a lot of effort in the efficient use and further development of the strengths in NRW's medical technology branch. This includes support and assurance in growth and employment.

The aim of the cluster work is to upgrade the provision of medical services and care of the citizens and to foster the scientific profile of NRW. Additionally, the research and development in the area of medical technology should be driven by the users' needs.

The Cluster management aims at stimulating innovations, creating cooperation across the borders and initiating an intensive collaboration between the involved persons in different steps of innovation. This goal should be reached through constructive networking of all parties involved.

The Cluster Medical Technology in NRW will be present with an own stand on the BMT in Jena. We are looking forward to getting in touch with you and to answer your questions regarding cooperation and cross-border projects as well as to give you an overview of the situation of medical technology in North Rhine-Westphalia.

Partners of Cluster Medical Technology North Rhine-Westphalia:

- AKM Innovationsmanagement GmbH (Aachen Centre of Competence for Medical Technology)
- MedEcon Ruhr GmbH (Medicine Economy Ruhr)
- Gesundheitsregion KölnBonn e.V. (HealthRegion CologneBonn e.V.)
- Brancheninitiative Gesundheitswirtschaft Südwestfalen e.V. (Health Business Competence Network South Westphalia)
- Institut für Angewandte Medizintechnik, Abteilung Science Management, der RWTH Aachen (Institute of Applied Medical Engineering (SCM-AME))
- DGBMT - German Society for Biomedical Engineering within VDE

A	Training and Further Education
B	Imaging and Image Processing
C	Image Based Intervention
D	Biomaterials and Biocompatibility
E	Biosensors and Bioanalytics
F	Biosignal Processing
G	Cellular-, Tissue- und Bioengineering
H	Surgical Technique and Endoscopy
I	Clinical Engineering
J	Ergonomics and Risk Management
K	Home health care and AAL
L	Clinical and Ambulatory Monitoring
M	Magnetic Methods in Medicine
N	Medical Information Systems, Telemedicine, eHealth, mHealth
O	Modelling and Simulation
P	Ophthalmology Techniques, Optical and Photonic Processes
Q	Personalized Medical Technology
R	Prevention and Rehabilitation Engineering
S	Prosthetics and Implants
Z	Special Sessions

Room: HS1

Keynote 1

8:30 **In-vivo Human Molecular Imaging Using PET-MRI Fusion Imaging Technology**

Zang-Hee Cho (Gachon University of Medicine and Science, Korea)

Brain dedicated PET-MRI using High resolution HRRT-PET and Ultra High Field 7.0T Magnetic Resonance Imaging (MRI) and their applications to Brain Research, Medicine and Biology will be discussed. Among the interesting topical areas, high resolution brain PET(HRRT) and the ultra high field MRI (7.0 T) will be highlighted. Increased field strength in MRI in the last few years has provided a large amount of experiences in both imaging of anatomy to functional activities of our brain. With high field MRI, such as the 7.0T MRI, one can now visualize the substructures of the thalamus and brainstem in-vivo as well as tractography hitherto unable to do with existing MRI systems. Together with molecular imaging using Positron Emission Tomography (PET), that is the brain dedicated PET-MRI fusion system using new brain dedicated Ultra high field 7.0T MRI developed recently, now, it is possible to visualize molecular mechanisms quantitatively in our human brain in-vivo. This new ultra-high resolution brain imaging tool can facilitate understanding of our human BRAIN, therefore, the treatment, surgery, and rehabilitation of various neurological diseases such as Parkinson's and Alzheimer's diseases.

09:15 - 09:30 Break - Trade Exhibition

Room: HS1 [Presentations in English]

Track F

Biosignal Processing – Cardiovascular System

Chairs: Andreas Voß (University of Applied Sciences Jena, DE); Peter Van Leeuwen (Grönemeyer Institute of Microtherapy, DE)

09:30 **Continuous and non-invasive central blood pressure monitoring at the sternum**

Martin Proença, Abdessamad Falhi, Damien Ferrario, Olivier Grossenbacher, Jacques-André Porchet, Jens Krauss, Josep Solà (Swiss Center for Electronics and Microtechnology (CSEM), CH)

09:45 **Novel telemetric signal averaging ECG approach to determine electrical atrial and ventricular conduction delays in implantable cardioverter defibrillator patients**

Anja Töpfer (University of Jena, DE); Ingolf Wehsener (Medtronic, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE); Helmut Kuehnert, Jakob Allmann, Daniela Eisentraeger, Hans Reiner Figulla, Matthias Heinke (University of Jena, DE)

10:00 **Assessment of fetal maturation by multiscale heart rate variability indices**

Florian Tetschke (Jena University Hospital, DE); Dirk Hoyer, Samuel Nowack, Stephan Bauer (Friedrich Schiller University Jena, DE); Ekkehard Schleußner (Universitätsklinikum Jena, DE); Uwe Schneider (Friedrich Schiller University Jena, DE)

10:15 **Rhythmical and Morphological Features of the ECG Following a Premature Ventricular Contraction**

Gustavo Lenis, Tobias Baas, Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)

10:30 **Altered cardiovascular couplings of heart rate and blood pressure in pregnant women suffering from pre-eclampsia**

Claudia Fischer; Andreas Voss (University of Applied Sciences Jena, DE)

10:45 **Long-term versus short-term heart rate variability analyses for risk stratification in ischemic heart failure patients**

Rico Schroeder (University of Applied Sciences Jena, DE); Caminal Pere; Vallverdu Montserrat; Helena Brunel (Technical University of Catalonia Barcelona, ES); Iwona Cygankiewicz (Sterling Memorial University Hospital Lodz, PL); Rafael Vázquez García (Hospital Universitario Puerta del Mar, ES); Antonio Bayés de Luna (Hospital Sant Pau, ES); Andreas Voss (University of Applied Sciences Jena, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS2** [Presentations in German] **Track S****Cardiovascular implants**

Chair: Klaus-Peter Schmitz (Universität Rostock, DE)

- 09:30 **Numerical and Experimental Analysis of Mechanical Loads on Stent-Vessel-Systems**
Michael Stiehm; Heiner Martin; Daniel Quosdorf; Martin Brede; Klaus-Peter Schmitz; Alfred Leder (University of Rostock, DE)
- 09:45 **Coating of collars via fluidised-bed process**
Monika Wentzlaff; Anne Seidlitz; Stefan Nagel (Ernst-Moritz-Arndt-Universität Greifswald, DE); Claus Harder; Christian Schnittker; Erik Trip (BIOTRONIK SE & Co. KG, DE); Niels Grabow; Katrin Sternberg (Universität Rostock, DE); Werner Weitschies (Ernst-Moritz-Arndt-Universität Greifswald, DE)
- 10:00 **Geometric adaption of resorbable myocardial stabilizing structures based on the magnesium alloys LA63 and ZEK100 for the support of myocardial grafts on the left ventricle**
Michael Bauer; Thomas Hassel; Christian Biskup (Leibniz Universität Hannover, DE); Dagmar Hartung; Tobias Schilling (Hannover Medical School, DE); Martin Weidling; Peter Wriggers (Leibniz Universität Hannover, DE); Frank Wacker (Hannover Medical School, DE); Friedrich-Wilhelm Bach (Leibniz Universität Hannover, DE); Axel Haverich (Hannover Medical School, DE)
- 10:15 **Development and Preclinical Testing of a Miniaturized Implantable Ventricular Assist Device**
Adrian Wisniewski; Andreas Arndt; Kurt Graichen; Jörg Müller (Berlin Heart GmbH, DE); Ludwig Erd (Magnetics Engineering, DE); Helge Krambeck; Manfred Göllner; Peter Nüsser (Berlin Heart GmbH, DE)
- 10:30 **A comparative study of numerical and experimental evaluation of RF-induced heating for an endovascular stent-graft at 1.5T and 3T**
Bruno Camps-Raga; Wolfgang Goertz; Gregor Schaefer (MR.comp GmbH, DE); Yoav Mezape; Alon Shalev (Endospan Ltd., IL)
- 10:45 **Impact of polymer/drug coatings on the biomechanical performance of self-expanding peripheral drug-eluting stents**
Lena Schmitt; Niels Grabow; Ulrike Lehmann; Christian Eschenburg; Katrin Sternberg; Klaus-Peter Schmitz (Universität Rostock, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS3** [Presentations in English] **Track B****Image Processing**

Chairs: Hartmut Dickhaus (University of Heidelberg, DE); Werner Korb (Leipzig University of Applied Sciences, DE)

- 09:30 **Mosaicking images of the corneal sub-basal nerve plexus using hierarchical block-based image registration**
Stephan Allgeier; Franz Eberle; Bernd Köhler; Susanne Maier (Karlsruher Institut für Technologie (KIT), DE); Andrey Zhivov (Universität Rostock, DE); Georg Bretthauer (Karlsruhe Institute of Technology (KIT), DE)
- 09:45 **MicroScout - An Assistance System for Histological Analysis in Forensics**
Ute von Jan (Hannover Medical School, DE); Heinrich Ernst (Fraunhofer Institute for Toxicology and Experimental Medicine ITEM, DE); Herbert Matthies; Urs-Vito Albrecht (Hannover Medical School, DE)
- 10:00 **Virtual Navigator Tridimensional Panoramic Imaging in Transcranial Application**
Leonardo Forzoni; Sara D'Onofrio; Stefano De Beni (Esaote S.p.A., IT); Marcella Laganà (Fond. Don Carlo Gnocchi Onlus, Milano, IT); Velizar Kolev (MedCom GmbH, IT); Giuseppe Baselli (Politecnico di Milano, IT); Gabriele Ciuti; Daniele Righi (Azienda Ospedaliero-Universitaria Careggi, IT)
- 10:15 **Improvements on the Feasibility of Active Shape Model-based Subthalamic Nucleus Segmentation**
Florian Bernard; Peter Gemmar; Andreas Husch (University of Applied Sciences Trier, DE); Frank Hertel (Centre Hospitalier de Luxembourg, LU)
- 10:30 **An automated approach to analyze microstructural remodeling from confocal microscopies of ventricular myocytes from diseased hearts**
Eike M Wülfers (Karlsruhe Institute of Technology (KIT), DE); Natalia S. Torres (University of Utah, USA); Gustavo Lenis (Karlsruhe Institute of Technology (KIT), DE); Hui Li (University of Utah, USA); Gunnar Seemann; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE); John H. B. Bridge; Frank B Sachse (University of Utah, USA)
- 10:45 **Fast Explicit Variational Diffusion Registration**
Andreas Mang; Alina Toma; Stefan Becker; Tina Anne Schütz; Thorsten M. Buzug (Universität zu Lübeck, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: HS4 [Presentations in English] Track O

Modeling and Simulation of Lung, Respiration and Ventilation

Chairs: Knut Moeller (Furtwangen University, DE);
Stefan Schumann (University Medical Center of Freiburg, DE)

- 09:30 **Covariance Analysis for Practical Identifiability of an Alveolar Recruitment Model**
Christoph Schranz (Furtwangen University, DE); Paul Docherty; Yeong Shiong Chiew (University of Canterbury, New Zealand); Knut Moeller (Furtwangen University, DE); Geoff Chase (University of Canterbury, New Zealand)
- 09:45 **Comparison of six models of the respiratory system based on parametric estimates from three identification models**
Kristel Lopez-Navas; Eva Rother; Ullrich Wenkebach (University of Applied Sciences Lübeck, DE)
- 10:00 **Evaluation of an etCO₂ predicting model**
Axel Riedlinger (Furtwangen University, DE); Jörn Kretschmer (Furtwangen University & TU Dresden, DE); Knut Moeller (Furtwangen University, DE)
- 10:15 **Damping of the dynamic pressure amplitude in the ventilatory circuit during high-frequency oscillatory ventilation**
Martin Rožánek; Zuzana Horáková; Ondřej Čadek; Martin Kučera; Karel Roubík (Czech Technical University in Prague, CZ)
- 10:30 **A Hybrid Combination of Interacting Physiological Models**
Jörn Kretschmer (Furtwangen University & Technische Universität Dresden, DE); Zhanqi Zhao; Erick Drost; Thomas Haunsberger (Furtwangen University, DE); Edmund Koch (Technische Universität Dresden, DE); Knut Moeller (Furtwangen University, DE)

Room: HS5 [Presentations in German] Track A

Training and Further Education

Chairs: Marc Kraft (Technische Universität Berlin, DE);
Ute Morgenstern (Technische Universität Dresden, DE)

- 09:30 **Co-operative Blended Learning Biomedical Engineering**
Jan Kožuško; Julia Kuß; Hans Dietrich; Susanne Hebestadt; Claudia Weichert; Anja Abdel-Haq; Inge Rudolph; Ute Morgenstern (Technische Universität Dresden, DE)
- 09:45 **Using Gigapixel Technology for a Cell Biology E-Learning Module**
Thomas Kupka; Stephanie Groos; Herbert Matthies; Marianne Behrends (Hannover Medical School, DE)
- 10:00 **Irradiation system for pre-clinical studies with laser accelerated electrons**
Michael Schürer (OncoRay - TU Dresden, DE); Michael Baumann (Medical Faculty Carl Gustav Carus, DE); Elke Beyreuther (Helmholtz-Zentrum Dresden-Rossendorf, DE); Kerstin Brüchner (OncoRay - TU Dresden, DE); Wolfgang Enghardt (Technische Universität Dresden, DE); Malte Kaluza (Friedrich-Schiller-Universität Jena, DE); Leonhard Karsch; Lydia Laschinsky (OncoRay - TU Dresden, DE); Elisabeth Leßmann (Helmholtz-Zentrum Dresden-Rossendorf, DE); Maria Nicolai (Friedrich-Schiller-Universität Jena, DE); Melanie Oppelt (OncoRay - TU Dresden, DE); Maria Reuter (Friedrich-Schiller-Universität Jena, DE); Christian Richter (OncoRay - TU Dresden, DE); Alexander Sävert; Michael Schnell (Friedrich-Schiller-Universität Jena, DE); Julia Woithe (OncoRay - TU Dresden, DE); Jörg Pawelke (OncoRay - TU Dresden)
- 10:15 **Multimodal Electronic Assessments with Active Voice Input**
Andreas Ritter; Mazdak Karami; Gereon Schäfer; Martin Baumann (RWTH Aachen University, DE)
- 10:30 **mARble - Augmented Reality in Medical Education**
Ute von Jan; Christoph Noll; Marianne Behrends; Urs-Vito Albrecht (Hannover Medical School, DE)
- 10:45 **Evaluation of the Jena skin flap model for the training of the closure of facial skin defects**
Sibylle Voigt; Gerlind Schneider (Friedrich Schiller University Hospital Jena, DE); Peter Litschko; Thomas Körbs (3di GmbH, DE); Orlando Guntinas-Lichius (Universitätsklinikum Jena, DE)

Room: **HS6** [Presentations in German] **Track M****Magnetic Particles in Diagnostics and Therapie**

Chairs: Thorsten M. Buzug (Universität zu Lübeck, DE);
Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)

- 09:30 **Magnetic particle hyperthermia - Properties of magnetic multicore nanoparticles administered to tumor tissue**
Silvio Dutz (IPHT Jena, DE); Melanie Kettering; Ingrid Hilger (University Hospital Jena, DE); Robert Müller; Matthias Zeisberger (Institute of Photonic Technology Jena, DE)
- 09:45 **mVCAM-1 specific iron oxide nanoparticle based probes for multimodal imaging purposes**
Gabriella Rimkus (Jena University Hospital, DE); Cordula Grüttner (Micromod Partikeltechnologie GmbH, DE); Sibylle Bremer-Streck; Karl-Heinz Herrmann; Ines Krumbein; Jürgen R. Reichenbach; Martin Foerster; Werner Kaiser; Ingrid Hilger (Jena University Hospital, DE)
- 10:00 **Detection and distribution of superparamagnetic nanoparticles in lymphatic tissue in a breast cancer model for magnetic particle imaging**
Dominique Finas (University of Lübeck & Evangelisches Krankenhaus Bielefeld, DE); Kristin Baumann; Lotta Sydow; Katja Heinrich; Ksenija Gräfe; Thorsten M. Buzug; Kerstin Lütke-Buzug (University of Lübeck, DE)
- 10:15 **Quantification of small magnetic nanoparticle characteristics by temperature dependent magnetorelaxometry**
Christian Knopke (TU Berlin & Physikalisch-Technische Bundesanstalt, DE); Frank Wiekhorst (Physikalisch-Technische Bundesanstalt, DE); Ines Gemeinhardt; Monika Ebert; Jörg Schnorr; Matthias Taupitz (Charité University Medicine Berlin, DE); Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)
- 10:30 **Novel magnetic targeting models with superparamagnetic iron oxides**
Ioana Slabu (RWTH Aachen University, DE); Anjali Röth (RWTH Aachen University Hospital, DE); Gernot Güntherodt; Thomas Schmitz-Rode; Martin Baumann (RWTH Aachen University, DE)
- 10:45 **Tracking of the pharmaceutical dissolution process with magnetoresistive sensors**
Sebastian Biller; Jörg Domey; Patrique Fiedler (Ilmenau University of Technology, DE); Rocco Holzhey (Innovent e. V., DE); Hendryk Richert (Matesy GmbH, DE); Jens Haueisen (Ilmenau University of Technology, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS7** [Presentations in English] **Track Q****FS: Patient Customized Engineering**

Chairs: Thomas Schmitz-Rode (RWTH Aachen University, DE);
Timo Paulus (Philips Technologie GmbH Innovative Technologies, DE)

- 09:30 **The Aachen Cluster "Patient Customized Engineering" - Challenges and Solutions**
Thomas Schmitz-Rode (RWTH Aachen University, DE)
- 09:40 **Generation and imaging of patient customized implants**
Julia Frese; Philipp Schuster; Marianne Mertens; Andreas Vogg (RWTH Aachen University, DE); Ulrike Dahlems (Pharmedartis GmbH, DE); Lisanne Rongen; Sabine Koch; Petra Mela (RWTH Aachen University, DE); Georg Melmer (Pharmedartis GmbH, DE); S. Barth (RWTH Aachen University, DE); Felix Mottaghy (University Hospital Aachen, DE); Thomas Schmitz-Rode; Twan Lammers; Stefan Jockenhoewel (RWTH Aachen University, DE); Fabian Kiessling (University Hospital Aachen, DE)
- 10:00 **Patient-oriented Emergency Care - a Telemedical Rescue Assistance System**
Marie-Thérèse Schneiders (Aachen University, DE); Frederik Hirsch (University Hospital Aachen, DE); Christian Büscher; Daniel Schilberg; Sabina Jeschke (Aachen University, DE)
- 10:20 **Individualized Biomonitoring in Heart Failure - "Keep an eye on heart failure - especially at night"**
Thomas Vollmer (Philips Research, DE)
- 10:40 **In.nrw Hyther: Electromagnetically navigated in situ fenestration of aortic stent grafts**
Hong-Sik Na; Tobias Penzkofer; Peter Isfort; Christoph Wilkmann; Andreas Mahnken (University Hospital Aachen, DE); Christiane Kuhl (RWTH Aachen University, DE); Sabine Osterhues (Vygon GmbH & Co. KG, Aachen, DE); Andreas Besting (SurgiTAIX AG, Herzogenrath, DE); Christoph Hänisch; Stefan Bisplinghoff; Johannes Jansing; Sylvie von Werder; Matias de la Fuente; Catherine Disselhorst-Klug; Thomas Schmitz-Rode (RWTH Aachen University, DE); Philipp Bruners (University Hospital Aachen, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: HS8 [Presentations in English] Track Z

EU Project: Autoscreen (1)

Chair: Klaus Palme (University of Freiburg, DE)

- 09:30 **AUTOSCREEN – A novel platform concept for automated high throughput high end microscopy**
Klaus Palme (Freiburg University, DE); Rainer Uhl (LM University Munich, DE)
- 09:40 **AUTOSCREEN – A novel platform concept for automated high throughput and high end microscopy**
Hartmann Harz, Stefan Laimgruber, Christian Seebacher, Max Baumann, Rainer Uhl (LM University Munich, TILL I.D. GmbH, DE)
- 10:10 **No need to FRET: sensitive imaging of protein structure and function by two-photon polarization microscopy**
Josef Lazar (ASCR, CZ)
- 10:30 **Quantitative imaging of single-organelle and single-molecule dynamics near the plasma membrane using a combination of spinning TIRF and virtual supercritical-angle detection**
Martin Oheim (INSERM, Université Paris Descartes, FR)

Room: HS1 [Presentations in English/German] Track F

Biosignal Processing - Central Nervous System / Sleep Analysis

Chairs: Thomas Penzel (Charité - Universitätsmedizin Berlin, DE); Gudrun Stockmanns (Hochschule Niederrhein, DE)

- 11:30 **Coupling analysis in sleep medicine by means of symbolic coupling traces**
Maik Riedl (Humboldt-Universität zu Berlin, DE); Thomas Penzel (Charité - Universitätsmedizin Berlin, DE); Niels Wessel (Humboldt-Universität zu Berlin, DE)
- 11:45 **Actigraphy Recordings with a Novel Wristwatch Device to Estimate Sleep Wake Model Parameters**
David Sommer; Martin Golz (University of Applied Sciences Schmalkalden, DE)
- 12:00 **Subject response variability in terms of colour and frequency of capacitive SSVEP measurements**
Marianne Gerloff; Meinhard Schilling (TU Braunschweig, DE)
- 12:15 **Spatial Harmonic Analysis of EEG Data**
Uwe Graichen (Ilmenau University of Technology, DE); Frank Zanow (Eemagine Medical Imaging Solutions GmbH, DE); Patrique Fiedler; Daniel Strohmeier; Jens Haeuelsen (Ilmenau University of Technology, DE)
- 12:30 **Pattern recognition of epileptic EEG grapho-elements with adaptive segmentation, supervised and unsupervised learning algorithms**
Vladimir Krajca (Czech Technical University in Prague & Faculty Hospital Na Bulovce Prague, CZ); Jiri Hozman (Czech Technical University in Prague, CZ); Jitka Mohylová (VSB-Technical University of Ostrava, CZ); Svojmil Petranek (Hospital Na Bulovce, CZ)
- 12:45 **Estimation of driver sleepiness based on EEG analysis**
Martin Golz; David Sommer (University of Applied Sciences Schmalkalden, DE)

Room: HS2 [Presentations in German] Track S

Electrical Stimulation and Neurotechnology

Chairs: Thomas Stieglitz (Albert-Ludwigs-Universität Freiburg, DE); Walter-G. Wrobel (Retina Implant AG, DE)

- 11:30 **Mechanical alternating loads in Neuroprosthetics: the example of subretinal implants**
Martin Kokelmann; Walter-G. Wrobel (Retina Implant AG, DE)
- 11:45 **A Front-End Circuit for Neural Recording Applications with Spectral Separation of LFP and Action Potentials Consuming 21 μ W per Channel**
Ulrich Bihl; Maurits Ortmanns (University of Ulm, DE)
- 12:00 **Long term in vivo stability and frequency response of polyimide based flexible array probes**
Susanne Löffler; Yijing Xie; Paula Klimach (University of Luebeck, DE); Anja Richter (Fraunhofer EMB, DE); Peter Detemple (Institut für Mikrotechnik Mainz GmbH, DE); Thomas Stieglitz (University of Freiburg, DE); Andreas Moser (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- 12:15 **Production and Characterization of Encapsulation Layers**
Michael Weinmann; Wilfried Nisch; Alfred Stett; Volker Bucher (University of Tuebingen, DE); Gerald Urban (University of Freiburg, DE)
- 12:30 **A hybrid miniaturized hermetic vision prosthesis with 232 stimulating channels**
Juan Ordonez; Martin Schuettler (University of Freiburg, DE); Maurits Ortmanns (University of Ulm, DE); Thomas Stieglitz (University of Freiburg, DE)
- 12:45 **Design of small electrodes for matrix stimulation of finger muscles**
Thordur Helgason (Landspítali - University Hospital, Iceland); Rosa Hugosdottir; Haraldur Sigthorsson (Reykjavik University, Iceland); Vilborg Gudmundsdottir; Paolo Gargiulo; Pall Ingvarsson (Landspítali - University Hospital, Iceland)

Room: HS3 [Presentations in English] Track B

Imaging: MR , CT, and Ultrasound

Chairs: Thorsten M. Buzug (Universität zu Lübeck, DE); Georg Schmitz (Ruhr-University Bochum, DE)

- 11:30 **A Novel Acquisition Scheme for Higher Axial Resolution and Improved Image Quality in Digital Tomosynthesis**
Yulia M. Levakhina (Universität zu Lübeck, DE); Robert L. Duschka; Florian M. Vogt; Joerg Barkhausen (University Hospital Schleswig-Holstein, DE); Thorsten M. Buzug (Universität zu Lübeck, DE)
- 11:45 **Calibration of fibre-optic RF E/H-field probes using a magnetic resonance (MR) compatible TEM cell and dedicated MR measurement techniques**
Tobias Klepsch (Luebeck University of Applied Sciences, DE); Tomasz Lindel; Werner Hoffmann (PTB Berlin, DE); Henrik Botterweck (Luebeck University of Applied Sciences, DE); Bernd Ittermann (PTB Berlin, DE); Frank Seifert (Physikalisch-Technische Bundesanstalt Berlin, DE)
- 12:00 **Cardiac MR: Imaging of the Foetal Heart Dynamics using Doppler Ultrasound Triggering**
Friedrich K.W. Ueberle; Eike Dettmann; Christina Eden; Jeevitha Jayakumar (Hamburg University of Applied Sciences, DE); Marisa Jelinek; Chressen Much; Björn Schönnagel; Manuela Tavares-de-Sousa; Ulrike Wedegärtner; Jin Yamamura (Universitätsklinikum Eppendorf, DE)
- 12:15 **Investigation of kerfless PZT and PVDF based ultrasound arrays**
Dimitri Ackermann; Georg Schmitz (Ruhr-University Bochum, DE)
- 12:30 **Computing Synthetic Echocardiography Volumes for Automatic Validation of 3D Segmentation Results**
Birgit Stender (University of Luebeck, DE); Bo Wang (Xi'an Jiaotong University, DE); Alexander Schlaefer (University of Luebeck, DE)
- 12:45 **Robust adaption algorithm for effective and safe sonoporation therapy**
Karin Hensel; Abdelouahid Maghnouj; Stephan Hahn; Georg Schmitz (Ruhr-University Bochum, DE)

Room: HS4 [Presentations in English] Track O

Modeling and Simulation of Spine and Hip, FEM-Modeling

Chairs: Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)

- 11:30 **Effects of individual spine curvatures - a comparative study with the help of computer modelling**
Sabine Bauer; Ulrike Hausen; Karin Gruber (Universität Koblenz-Landau, DE)
- 11:45 **Biomechanical Effects of a Spinal Implant - Investigation through MBS Computer Modelling**
Ulrike Hausen; Sabine Bauer; Karin Gruber (Universität Koblenz-Landau, DE)
- 12:00 **Simulation of fluoroscopic localization for surgical training**
Michael Rullmann; Marc Hirschfeld; Christian Petzold; Gerold Bausch; Matthias Sturm Sturm; Werner Korb (Leipzig University of Applied Sciences, DE)
- 12:15 **Nonlinear Femur-Hip Prosthesis Network Model**
Uwe Marschner; Eric Starke; Sebastian Sauer; Wolf-Joachim Fischer (Technical University of Dresden, DE); Bernhard Clasbrummel (Zollernalb-Klinikum, DE)
- 12:30 **Simulation of Adaptive Structures Made of Textile and Shape Memory Alloy**
Welf-Guntram Drossel; Christoph Ohsenbrügge (Fraunhofer Institute for Machine Tools and Forming Technology IWU, DE); Heike Oschatz (TITV Greiz, DE); Christian Rotsch; Björn Senf (Fraunhofer-Institut für Werkzeugmaschinen und Umformtechnik, DE)

Room: HS5 [Presentations in German] Track A

FS: Training and Further Education

Chairs: Marc Kraft (Technische Universität Berlin, DE); Ute Morgenstern (Technische Universität Dresden, DE)

- 11:30 **First Experiences in the Bachelor/Master Program "Biomedical Engineering" with the Advanced Program "Radiological Techniques and Radiation Protection"**
Dunja Jannek; Andreas Keller; Jens Hauelsen (Ilmenau University of Technology, DE)
- 11:50 **ProMEB - concept of a project-oriented and course-related program in the field of medical engineering**
Sabine Krüger-Ziolek; Zhanqi Zhao; Knut Moeller (Furtwangen University, DE)
- 12:10 **Promoting young "MINT"-talents in pre-school and school children as future specialists in biomedical engineering**
Claudia Weichelt; Jan Kožuško; Julia Kuß; Hans Dietrich; Susanne Hebestadt; Ute Morgenstern (Technische Universität Dresden, DE)
- 12:30 **DGBMT-Fachausschuss "Aus- und Weiterbildung - BMT im Studium": Vorstellung und Diskussion des Positionspapiers und des Statuspapiers zur "Aus- und Weiterbildung Biomedizinische Technik"**
Ute Morgenstern (Technische Universität Dresden, DE); Marc Kraft (Technische Universität Berlin, DE); Thomas Schmitt (BA Bautzen, DE); Maria Zellerhoff (Forum MedTech Pharma e. V. & Bayern Innovativ GmbH, DE); Sabine Fincke (TU Ilmenau, DE); Anja Abdel-Haq (TU Dresden, DE); Martin Baumann (RWTH Aachen University, DE); Karsten Seidl (Robert Bosch GmbH, DE)
- 12:50 **Wie schreibe ich einen wissenschaftlichen Artikel?**
Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)

Room: **HS6** [Presentations in German] **Track M****FS: Application of magnetic nanoparticles in biomedicine**Chairs: Uwe Steinhoff, Frank Wiekhorst (*Physikalisch-Technische Bundesanstalt, DE*)

- 11:30 **Magnetische Nanopartikel in der Biomedizin: Von der Entwicklung bis hin zur klinischen Anwendung**
Michael Apel (MiltenyiBiotec GmbH, DE)
- 12:00 **Magnetische Nanopartikel für die in vivo Diagnostik und für die Therapie**
Matthias Taupitz; Susanne Wagner (Charité - Universitätsmedizin Berlin, DE); Dietmar Eberbeck (Physikalisch-Technische Bundesanstalt, DE); Jörg Schnorr (Charité - Universitätsmedizin Berlin, DE)
- 12:15 **Funktionalisierte magnetische Nano- und Mikropartikel für Anwendungen im Life Science Bereich**
Christian Bergemann (Chemicell GmbH, DE)
- 12:30 **Polysaccharid-basierte Magnetpartikel heutiger Stand und künftige Herausforderungen**
Cordula Grüttnner (Micromod Partikeltechnologie GmbH, DE)
- 12:45 **Magnetische Nanopartikel für Gentransfer**
Olga Mykhaylyk (Technische Universität München, DE)

Room: **HS7** [Presentations in German] **Track Q****Personalized Medical Technology**Chairs: Cord Schlötelburg (*VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V. & DGBMT Deutsche Gesellschaft für Biomedizinische Technik im VDE, DE*); Stefan Bohn (*Universität Leipzig, DE*)

- 11:30 **An integrated IT-platform for personalized health-care in oncologic ENT treatment**
Stefan Bohn; Thomas Neumuth; Jens Meier (Universität Leipzig, DE); Gero Strauss; Andreas Boehm (Universitätsklinik Leipzig, DE)
- 11:45 **Development of a modular IT-framework supporting the oncological patient treatment in ENT surgery**
Jens Meier (Universität Leipzig, DE); Andreas Boehm (Universitätsklinik Leipzig, DE); Erik Schreiber; Sebastian Lippert; Thomas Neumuth; Stefan Bohn (Universität Leipzig, DE)
- 12:00 **Towards Personalized Biophysical Models of Atrial Anatomy and Electrophysiology in Clinical Environments**
Martin W Krueger; Gunnar Seemann; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 12:15 **Integrated Monitoring for Personalized Renal Replacement Therapy**
Lukas Pielawa; Frank Poppen (OFFIS, DE); Maarten Wester (University Medical Center Utrecht, NL); Frank Simonis (Nanodialysis BV, NL); Melina Brell (OFFIS Institut für Informatik Oldenburg, DE); Jaap Joles (University Medical Center Utrecht, NL); Andreas Hein (Universität Oldenburg, DE)
- 12:30 **Diagnostic Platform for Automated Personalized Chemosensitivity Assays**
Christian Reis (Fraunhofer Institute for Manufacturing Engineering and Automation, DE); Christof Steiner (DITABIS Digital Biomedical Imaging Systems AG, DE); Caroline Siegert (Fraunhofer Institute for Manufacturing Engineering and Automation, DE); Harald Seeger (Universitäts-Frauenklinik Tübingen, DE)
- 12:45 **A feasibility study for the integration of 3D accelerometry in fall risk assessment**
Cristina Soaz (Technical University Munich, DE); Martin Daumer (Sylvia Lawry Centre for MS Research, DE)

Room: HS8 [Presentations in English] Track Z

EU Project: Autoscreen (2)

Chair: Klaus Palme (University of Freiburg, Germany)

- 11.30 **Setting up high-content applications for detection of mRNAs and miRNAs in plants**
M. Begheldo, M. Zermiani, A. Nonis, S. Trevisan, N. Krieghoff, B. Ruperti (University Padova, Agripolis, IT)
- 11.50 **AUTOSCREEN renders growth processes visible – application to Arabidopsis root growth**
A. Dovzhenko, F. D. Ditengou, X. Li, B. Wang, J. Dürr, W. Teale, T. Blein, I. A. Paponov, O. Tietz, K. Palm, (University of Freiburg, DE)
- 12.10 **Autoscreen and beyond**
T. Moore (Cybio, Jena, DE)
- Gerätedemonstration am Stand

Room: HS1

Keynote 2

- 14:00 **Bioelectric environments for stem cell derived neurons and cardiomyocytes**
Jari Hyttinen (Tampere University of Technology, FI)

Human embryonic (hESC) and recently human induced pluripotent stem cells (hiPSC) provide means to produce most human cell types and moreover hiPSC provide means to get patient specific cells and tissues. Our objective is to develop novel methods to produce and assess functional neuronal cells and cardiomyocytes from human stem cells. These cells are urgently needed to treat neurological disorders, traumas and cardiac failure in humans. Moreover, these cells offer a completely new opportunities for disease and drug discovery platforms for personalized therapy. Hence, new approaches to produce functional cells and moreover methods to analyse the functionality of the cells are well warranted. Bioelectric measurements offer a label free non-invasive way to assess the functionality of neuronal cells and cardiomyocytes. In vitro cultivation system integrated microelectrode array (MEA) technology allows the measurement of electrical signalling activity at the cell, tissue, and network-level. The electrical activity of cardiomyocytes and neuronal cells can be measured while the cellular network develops in vitro on a growth plate with embedded recording and stimulus electrodes. Moreover, we have investigated and assembled biomimetic cell culture environments with integrated biomaterials, microfluidics of medium exchange, pH, oxygen, temperature measurements into the in vitro microelectrode arrays, producing multimodal biomimetic active platform for stem cell differentiation and functional assessment and developed tools. Using these environments proof of the hESC derived active neuronal networks and hiPSC derived cardiomyocytes with patient specific ion channels mutations were investigated. Our next goal is to investigate ways to expand the technology to three dimensional bioelectric culturing environments with multi-type of cells in controlled 3D culture system. For example, in a new FP7 FET-Open project 3DNeuroN, the technology is expanded to 3D neuronal cultures featuring glia and neuronal cells with layered structure of human brain integrated with novel 3D MEA electrode scheme providing new window for neuronal and brain development and ICT interaction.

Room: HS1 [Presentations in English] Track F

Biosignal Processing – Methods and Application

Chairs: Tilmann Sander-Thoemmes (Physikalisch-Technische Bundesanstalt, DE), Gerhard Staude (University FAF Munich, DE)

- 15:00 **Solving the Transmembrane Potential Based Inverse Problem of ECG under Physiological Constraints on the Solution Range**
Danila Potyagaylo; Walther H W Schulze; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 15:15 **Reconstruction of atrial excitation conduction velocities and implementation into the inverse problem of electrocardiography**
Dan-Timon Rudolph; Walther H W Schulze; Danila Potyagaylo; Martin W Krueger; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 15:30 **Multivariate Statistics for Artifact Reduction in Multichannel ECG Recordings Acquired with Textile Electrodes**
Dennis Zelle; Patrique Fiedler; Jens Hauelsen (Ilmenau University of Technology, DE)
- 15:45 **Training of a Kalman Filter with Augmented Measurement Model on Scar Data for Noninvasive Cardiac Imaging**
Walther H W Schulze; Danila Potyagaylo; Francesc Elies Henar; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 16:00 **Asynchronous Time Encoding: An Approach to Sub-Nyquist Rate Sampling**
Thanks Marisa (Bern University of Applied Sciences & University of Bern, CH)
- 16:15 **Decomposition of Somatosensory Evoked Potentials in Rats**
Maciej Gratkowski (University of Constance, DE); Silvio Schmidt; Daniel Güllmar (Jena University Hospital, DE); Otto Witte (Friedrich Schiller University Jena, DE); Jens Hauelsen (Ilmenau University of Technology, DE)

16:30 - 17:00 Coffee break - Trade Exhibition

Room: HS2 [Presentations in English] Track S

**Intelligent Implants (1):
Devices for Cataract and Glaucoma**

Chairs: Georg Bretthauer (Karlsruhe Institute of Technology, DE); Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering & IBMT, DE)

- 15:00 **Investigation of the Accommodative Behaviour During Every Day Life Activities**
Jörg Nagel; Christoph Beck (Karlsruhe Institute of Technology (KIT), DE); Ulrich Gengenbach (Karlsruhe Institute of Technology & Campus North, DE); Helmut Guth; Georg Bretthauer (Karlsruhe Institute of Technology, DE)
- 15:15 **Experimental setup investigating the ability of the pupil to control an artificial lens implant**
Jan Michael Fliedner (Karlsruhe Institute of Technology (KIT), DE); Christian Heine (University Eye Hospital Tübingen, DE); Georg Bretthauer (Karlsruhe Institute of Technology (KIT), DE); Helmut Wilhelm (University Eye Hospital Tübingen, DE)
- 15:30 **Low temperature production process for hermetic transparent implant packages**
Liane Rheinschmitt; Lothar Hahn; Harald Leiste (Karlsruhe Institute of Technology (KIT), DE); Ulrich Gengenbach (Karlsruhe Institute of Technology & Campus North, DE); Georg Bretthauer (Karlsruhe Institute of Technology (KIT), DE)
- 15:45 **Design of an actuator for the demonstrator of an intraocular implant with lateral-shift optics**
Thomas Martin (Karlsruhe Institute of Technology, DE); Ulrich Gengenbach (Karlsruhe Institute of Technology & Campus North, DE); Helmut Guth; Georg Bretthauer (Karlsruhe Institute of Technology, DE)
- 16:00 **Can Low-Accuracy Clocks Enable Energy Efficient Real-Time Communication in Active Medical Implants?**
Christoph Beck; Jörg Nagel (Karlsruhe Institute of Technology (KIT), DE); Ulrich Gengenbach (Karlsruhe Institute of Technology & Campus North, DE); Helmut Guth; Georg Bretthauer (Karlsruhe Institute of Technology, DE)
- 16:15 **Comparison of different power supply topologies to improve power efficiency of the Artificial Accommodation System**
Markus Krug; Jörg Nagel (Karlsruhe Institute of Technology (KIT), DE); Ulrich Gengenbach (Karlsruhe Institute of Technology & Campus North, DE); Helmut Guth; Georg Bretthauer (Karlsruhe Institute of Technology (KIT), DE)

16:30 - 17:00 Coffee break - Trade Exhibition

Room: **HS3** [Presentations in English] **Track B****Ultrasound Imaging**

Chairs: Michiel Postema (University of Bergen, NO); Friedrich K.W. Ueberle (Hamburg University of Applied Sciences, DE)

- 15:00 **Quantitative Phase Shift Variance Imaging**
 Monica Siepmann (Ruhr-University Bochum, DE);
 Jessica Bzyl; Stanley Fokong; Fabian Kiessling
 (University Hospital Aachen, DE); Georg Schmitz (Ruhr-
 University Bochum, DE)
- 15:15 **Real-time Processing of Coded Photoacoustic
 Signals**
 Martin F Beckmann; Lars Girke; Georg Schmitz (Ruhr-
 University Bochum, DE)
- 15:30 **Compressed Sensing for Fast Image Acquisition in
 Pulse-Echo Ultrasound**
 Martin F Schiffner; Timo Jansen; Georg Schmitz (Ruhr-
 University Bochum, DE)
- 15:45 **Fast 3D Pulse-Echo Ultrasound Imaging Using
 Diffraction Tomography**
 Timo Jansen; Martin F Schiffner; Georg Schmitz (Ruhr-
 University Bochum, DE)
- 16:00 **Full-Automated Medical Imaging System for
 Segmentation and Detection of Carotid Plaque and
 Carotid Artery Lumen from Ultrasound Images**
 Lakis Christodoulou (Cyprus University of Technology,
 Cyprus)
- 16:15 **Multigate Quality Doppler Profiles Technology in
 Vascular, Obstetrics and Cardiology Applications**
 Leonardo Forzoni (Esaote S.p.A., IT); Daniele Righi;
 Gabriele Ciuti (Azienda Ospedaliero-Universitaria
 Careggi, IT); Sandra Morovic; Iris Zavoreo (Sestre
 Milosrdnice University Hospital, Croatia); Federico
 Mecacci (Azienda Ospedaliero-Universitaria Careggi,
 IT); Claudio Bussadori (IRCCS Policlinico San Donato,
 IT); Piero Tortoli (Università degli Studi di Firenze, IT)

Room: **HS4** [Presentations in English] **Track O****Modeling and Simulation in Oncology and
of Electric Currents in the Body**

Chairs: Ursula van Rienen (Universität Rostock, DE);
 Waldemar Zylka (Westfälische Hochschule Gelsenkirchen, DE)

- 15:00 **Biological effectiveness in hypofractionation:
 Modeling tumor survival probability for large
 doses with a stochastic cell-cycle model**
 Thaïs Roque; Zehra Kalkan; Waldemar Zylka
 (Westfälische Hochschule Gelsenkirchen, DE)
- 15:15 **A Mathematical Model to Simulate Glioma Growth
 and Radiotherapy at the Microscopic Level**
 Alina Toma; Konstanze Holl-Ulrich; Stefan Becker;
 Andreas Mang; Tina Anne Schütz (Universität zu
 Lübeck, DE); Matteo Bonsanto; Volker Tronnier
 (University Hospital Schleswig-Holstein (UKSH),
 Campus Luebeck, DE); Thorsten M. Buzug (Universität
 zu Lübeck, DE)
- 15:30 **Software assistance for HIFU therapy planning**
 Hanne Tiesler (Fraunhofer MEVIS & Jacobs University
 Bremen gGmbH, DE); Sabrina Haase; Michael
 Schwenke; Jennifer Bieberstein; Tobias Preusser
 (Fraunhofer MEVIS, DE)
- 15:45 **Temperature elevation during medical diathermy**
 Florian Niedermayr; Norbert Leitgeb (Graz University of
 Technology, AT)
- 16:00 **Electrosurgery: CQM-Simulation without Volunteers**
 Norbert Nessler (Innsbruck University, AT); Marcel
 Salchner (Nessler Medizintechnik Innsbruck, AT)
- 16:15 **Sensitivity analysis of the field distribution in Deep
 Brain Stimulation with respect to the anisotropic
 conductivity of brain tissue**
 Christian Schmidt; Ursula van Rienen (University of
 Rostock, DE)

Room: **HS5** [Presentations in English] **Track A**

**Junges Forum trifft Alte Hasen (Young Forum gains knowledge from experienced colleagues)
– The development of innovations in ophthalmology**

Chair: *Karsten Seidl (Robert Bosch GmbH, DE)*

The Young Forum and experienced colleagues discuss the development and innovations in the field of ophthalmology.

Panel guests:

- *Karl-Heinz Donnerhacke, former Head of Advanced Development, Ophthalmological Systems, Carl Zeiss Meditec AG*
- *Manfred Dick, Head of Advanced Development, Ophthalmological Systems, Carl Zeiss Meditec AG*
- *Tobias Voita, Technolas Perfect Vision, Specialist Global Applications*
- *Alexander Dietzel, Research Assistant, TU Ilmenau*
- *Tanja Lange, Master's student, TU Ilmenau, Moderation*

Room: **HS6** [Presentations in English] **Track M**

FS: Ultra-Low-Field NMR/MRI

Chairs: *Martin Burghoff, Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)*

- 15:00 **Low-field MRI detected by tuned HTS SQUID utilizing permanent magnet as pre-polarization field**
Chao Liu; Yi Zhang (Forschungszentrum Jülich, DE); Hui Dong (Shanghai Institute of Microsystem and Information Technology, P.R.C.); Longqing Qiu (State Key Laboratory of Functional Materials for Informatics, P.R.C.); Hans-Joachim Krause (Forschungszentrum Jülich, DE); Xiaoming Xie (Shanghai Institute of Microsystem and Information Technology, P.R.C.); Andreas Offenhäuser (Forschungszentrum Jülich, DE)
- 15:15 **MRI at 10mT with spin electronics-based detection**
Quentin Herreros; Claude Fermon; Myriam Pannetier-Lecoeur; Amala Demonti (CEA Saclay, FR); Leila Rogeau (CEA Saclay/Inserm, FR); Paolo Campiglio (CEA Saclay, FR)
- 15:30 **Toward neuronal current spectroscopy at Ultra-Low field NMR**
Antonino M. Cassarà (Museo Storico della Fisica e Centro Studi e Ricerche "E. Fermi" & e/o University "La Sapienza", IT); Rainer Körber (Physikalisch-Technische Bundesanstalt, DE); Ingo Hilschenz (University of Leipzig, DE); Nora Hoefner; Jens Voigt (Physikalisch-Technische Bundesanstalt, DE); Tommaso Fedele; Andrea Kühn (Charité – University Medicine, DE); Bruno Maraviglia (University of Rome, "La Sapienza", IT); Martin Burghoff (Physikalisch-Technische Bundesanstalt, DE)
- 15:45 **Sequences for current-density and conductivity imaging with ultra-low-field MRI**
Jaakko O Nieminen; Panu T Vesanen; Risto J Ilmoniemi (Aalto University, FI)
- 16:00 **Detecting neuronal currents directly by low field NMR: a phantom study**
Rainer Körber; Nora Hoefner (Physikalisch-Technische Bundesanstalt, DE); Antonino M. Cassarà (Museo Storico della Fisica e Centro Studi e Ricerche "E. Fermi" & e/o University "La Sapienza", IT); Jens Hauelsen (Technical University Ilmenau, DE); Martin Burghoff; Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)

- 16:15 **Combination of MEG and MRI in one setup**
Risto J Ilmoniemi; Jaakko O Nieminen; Panu T Vesanen; Fa-Hsuan Lin; Juhani Dabek; Lauri Parkkonen; Koos Zevenhoven; Andrey Zhdanov (Aalto University, FI); Juho Luomahaara; Juha Hassel (VTT Technical Research Centre of Finland, FI); Jari Penttilä (Aivon Oy, FI); Juha Simola; Antti Ahonen (Elekta Oy, FI); Jyrki Mäkelä (Helsinki University Central Hospital, FI)

Room: HS7 [Presentations in English] **Track Z**

FS: Horizon 2020 – EU Funding of Biomedical Engineering

Chairs: Karin Lohmann (Helmholtz Association, DE); Cord Schlötelburg (VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V. & DGBMT Deutsche Gesellschaft für Biomedizinische Technik im VDE, DE)

- 15:00 **Horizon 2020: Status and Perspectives**
Karin Lohmann (Helmholtz Association, DE)
- 15:15 **Best Practice: Coordination of EU-Project „Biohybrid Templates for Peripheral Nerve Regeneration"**
Kirsten Haastert-Talini; Claudia Grothe (Hannover Medical School, DE)
- 15:30 **EAMBES - European Alliance for Medical and Biological Engineering & Science: An Overview**
Birgit Glasmacher (Leibniz Universität Hannover, DE)
- 15:45 **Panel discussion: EU Funding of Biomedical Engineering: Demands and Recommendations**
Hartmut Gehring (University of Luebeck & Universitätsklinikum Schleswig-Holstein, DE); Birgit Glasmacher (Leibniz Universität Hannover, DE); Michael Imhoff (Ruhr-University Bochum, DE); Karin Lohmann (Helmholtz Association, DE); Olaf Such (Philips Healthcare, DE)

Room: **HS8** [Presentations in German] **Track B****FS: Complementary Mamma Diagnosis**

Chairs: Marcus Radicke (Siemens Healthcare, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)

- 15:00 **Complementary Breast Diagnostic**
Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE); Rüdiger Schulz-Wendtland (Universität Erlangen-Nürnberg, DE)
- 15:15 **Technical Overview of Diagnostic Methods for Breast Cancer Detection**
Marcus Radicke; Ralf Nanke; Thomas Mertelmeier (Siemens Healthcare, DE)
- 15:30 **Advanced Breast MR Imaging Techniques**
Kuan Lee (Siemens, DE); Evelyn Wenkel; Rolf Janka (Universitätsklinikum Erlangen, DE)
- 15:45 **The physics of digital breast tomosynthesis**
Thomas Mertelmeier; Marcus Radicke; Anna Jerebko; Ralf Nanke (Siemens Healthcare, DE)
- 16:00 **Towards a Computer Assisted Diagnosis System for Digital Breast Tomosynthesis**
Thomas Wittenberg; Florian Wagner; Alexander Gryanik (Fraunhofer Institute for Integrated Circuits IIS, DE)
- 16:15 **Towards spatial correlation of multimodal breast images**
Fabian Zoehrer; Joachim Georgii (Fraunhofer MEVIS Institute for Medical Image Computing, DE); Horst K Hahn (Fraunhofer MEVIS & Jacobs University, Bremen, DE)

Room: **HS5** [Presentations in English] **Track F****Biosignal Processing – Miscellaneous topics**

Chairs: Hartmut Dickhaus (University of Heidelberg, DE); Werner Wolf (Universität der Bundeswehr München, DE)

- 17:00 **Computationally efficient time domain detection algorithm for characteristic points in non invasive continuous blood pressure measurements**
Dennis Lerch; Reinhold Orglmeister (TU Berlin, DE)
- 17:15 **ECG, PPG and ABP Sensor Fusion for a PCA-based Respiratory Activity Estimation**
Steffen Mann; Reinhold Orglmeister (Technische Universität Berlin, DE)
- 17:30 **Electrodermal activity and heart rate during visual reaction tasks**
Francine Mbeutcha; Michael Kröning; Thomas Schanze (Technische Hochschule Mittelhessen THM, DE)
- 17:45 **The relation of heart rate variability measures to psychophysiological variables with circadian rhythmicity**
Christian Heinze (University of Applied Sciences Schmalkalden, DE); Udo Trutschel (Circadian Technologies, Inc., USA); Martin Golz (University of Applied Sciences Schmalkalden, DE)
- 18:00 **Detection of Malingering in Dizzy Patients Utilizing Adaptive Pattern Recognition**
Thomas Schnupp; Adolf Schenka (University of Applied Sciences Schmalkalden, DE); Leif Walther (Centre of Otorhinolaryngology Sulzbach, DE); Alexander Blödown (Helios Clinic Berlin-Buch, DE); Martin Golz (University of Applied Sciences Schmalkalden, DE)
- 18:15 **Age-dependent changes of microcirculation in schizophrenic patients**
Andrea Seeck (University of Applied Sciences Jena, DE); Karl Jürgen Bär (Jena University Hospital, DE); Andreas Voss (University of Applied Sciences Jena, DE)

Room: **HS2** [Presentations in German] **Track S****Intelligent Implants (2):
Technologies and System Approaches**

Chairs: Peter Husar (Technische Universität Ilmenau, DE); Alfred Stett (NMI Naturwissenschaftliches und Medizinisches Institut, DE)

- 17:00 **Micro Particle-Image-Velocimetry for characterization of a micro-mechanical valve in a glaucoma implant**
Wolfram Schmidt; Daniel Quosdorf; Stefan Siewert (Universität Rostock, DE); Ulf Hinze; Boris Chichkov (Laser Zentrum Hannover e.V., DE); Martin Brede; Alfred Leder (Universität Rostock, DE); Rudolf Guthoff (Universität Rostock & Universitätsaugenklinik Rostock, DE); Klaus-Peter Schmitz (Universität Rostock, DE)
- 17:15 **Intelligent Power Management enables Autonomous Power Supply of Sensor Systems for Modern Prostheses**
Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)
- 17:30 **Design of power management in Energy Harvesting Devices**
Adrian Herber; Antonia Hanisch; Tim Gnoerrlich; Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)
- 17:45 **Development of a throttle for an implantable infusion pump using porous ceramics**
Yavuz Selim Mutlu (Luebeck University of Applied Science, DE); Stephan Klein; Bodo Nestler (Fachhochschule Luebeck, DE)
- 18:00 **Energy budget of an implantable glucose measurement system**
Thomas Basmer; Dieter Genschow; Marlen Froehlich; M. Birkholz (IHP-Leibniz-Institut für Innovative Mikroelektronik, DE)
- 18:15 **Piezoelectric Based Energy Management System for Powering Intelligent Implants and Prostheses**
Alexander Hofmann; Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)

Room: **HS3** [Presentations in English] **Track B****FS: Imaging and Pattern Recognition**

Chairs: Axel A. Brakhage (Leibniz Institut für Naturstoff, DE); Hans Peter Saluz (Leibniz-Institute for Natural Product Research and Infection Biology, DE)

- 17:00 **In situ Mass Spectrometric Visualization of Surface Chemistry of Plants and Insects (Stavos)**
Hans Peter Saluz (Leibniz-Institute for Natural Product Research and Infection Biology, DE)
- 17:15 **Cross-hybridizations - corrupting and enhancing microarray probe designs**
Fabian Horn; Reinhard Guthke (Leibniz Institut für Naturstoff-Forschung und Infektionsbiologie Hans-Knöll-Institut (HKI), DE)
- 17:30 **Three and four dimensional ¹⁸F fluoride microPET imaging of avian embryos in ovo**
Alexander Heidrich; Lydia Würbach (HKI Jena, DE); Thomas Opfermann (Jena University Hospital, DE); Peter Gebhardt (HKI Jena, DE); Hans Peter Saluz (Leibniz-Institute for Natural Product Research and Infection Biology, DE)
- 17:45 **A microfluidics-based approach to drug discovery**
Martin Roth; Karin Martin; Emerson Zang (Hans-Knöll-Institute, DE); Markus Nett (Leibniz Institute for Natural Product Research and Infection Biology - Hans-Knöll-Institute, DE); Thomas Henkel (Institute of Photonic Technology e.V. (IPHT), DE)
- 18:00 **Current status and new developments in hybrid imaging in nuclear medicine (Martin Freesmeyer)**
Martin Freesmeyer (Jena University Hospital, DE)

Room: HS4 [Presentations in English] Track O

Modeling and Simulation of Drug Release and of Eye and Ear

Chair: Marc Kraft (Technische Universität Berlin, DE)

- 17:00 **Particle release from drug eluting balloons and stents - simulated use testing**
Lucas Thieme; Marc Kraft (Technische Universität Berlin, DE)
- 17:15 **Examination of steroid release from screw-in pacing leads**
Beatrice Semmling; Anne Seidlitz (Ernst-Moritz-Arndt-Universität Greifswald, DE); Erik Trip; Christian Schnittker (BIOTRONIK SE & Co. KG, DE); Thomas Reske; Katrin Sternberg (Universität Rostock, DE); Werner Weitschies (Ernst-Moritz-Arndt-Universität Greifswald, DE)
- 17:30 **Flow simulation through porous ceramics used as a throttle in an implantable infusion pump**
Verena Schmitz; Yavuz Selim Mutlu (Luebeck University of Applied Science, DE); Erik Glatt (Fraunhofer Institute for Industrial Mathematics (ITWM), DE); Stephan Klein; Bodo Nestler (Luebeck University of Applied Science, DE)
- 17:45 **The Vitreous Model - a new in vitro test method simulating the vitreous body**
Christian Loch; Stefan Nagel (Ernst-Moritz-Arndt-Universität Greifswald, DE); Rudolf Guthoff (Universität Rostock & Universitätsaugenklinik Rostock, DE); Anne Seidlitz; Werner Weitschies (Ernst-Moritz-Arndt-Universität Greifswald, DE)
- 18:00 **Examining Basilar-Membrane Motion of an Auditory Model by using Tone-Burst Otoacoustic Emissions**
Sebastian Ley (Ilmenau University of Technology, DE); Anja Chilian (Ilmenau University of Technology & Fraunhofer Institute for Digital Media Technology (IDMT), DE); Tamas Harczos (Fraunhofer Institute of Digital Media Technology, DE); András Kátai (Fraunhofer Institute of Digital Media Technology & Fraunhofer IDMT, DE); Frank Klefenz (Fraunhofer IDMT, DE); Peter Husar (Technische Universität Ilmenau, DE)

Room: HS5 [Presentations in German] Track P

Ophthalmology Techniques, Optical and Photonic Methods

Chairs: Manfred Dick (Carl Zeiss Meditec AG, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE)

- 17:00 **Mechanical eye model for the comparison of optical imaging quality and physiology of human vision**
Andreas Drauschke; Elisabet Rank; Silke Verena Auer; Mathias Forjan; Lukas Traxler (University of Applied Sciences Technikum Wien, AT)
- 17:15 **Hyperspectral imaging - A new modality for eye diagnostics**
Julia Schweizer; Julia Hollmach (University of Technology Dresden, DE); Gerald Steiner (Clinical Sensing and Monitoring, DE); Lilla Knels; Richard Funk; Edmund Koch (University of Technology Dresden, DE)
- 17:30 **Intraoperative Applications of OCT in Ophthalmic Surgery**
Holger Matz (Carl Zeiss Meditec AG & Site Oberkochen, DE); Susanne Binder; Carl Glittenberg (Rudolf Foundation Clinic, Vienna, AT); Oliver Findl (Vienna Institute for Research in Ocular Surgery & Hanusch Hospital, Vienna, AT); Nino Hirschall (Vienna Institute for Research in Ocular Surgery, AT); Gabor Scharioth (Aurelios Augenzentrum, DE); Christoph Hauger (Carl Zeiss Meditec AG, DE)
- 17:45 **Spatial Beam Shaping for Femtosecond Laser in Vitreo-Retinal Surgery**
Anja Hansen; Tammo Ripken; Alexander Krüger (Laser Zentrum Hannover e.V., DE)
- 18:00 **The influence of a spatial and temporal pulse-overlap on the laser-tissue-interaction of modern ophthalmic laser systems**
Nadine Tinne; Eike Lübking (Laser Zentrum Hannover e.V., DE); Holger Lubatschowski (ROWIAK GmbH, DE); Alexander Krüger; Tammo Ripken (Laser Zentrum Hannover e.V., DE)
- 18:15 **Crystalline lens stretching device for simulation of accommodation**
Jan Hahn (Laser Zentrum Hannover e.V., DE); Michael Fromm (Rowiak GmbH, DE); Alexander Krüger (Laser Zentrum Hannover e.V., DE); Holger Lubatschowski (Rowiak GmbH, DE); Tammo Ripken (Laser Zentrum Hannover e.V., DE)

Room: **HS6** [Presentations in English] **Track M****FS: Field modeling in the human head**

Chairs: Jens Haueisen (Technical University Ilmenau, DE);
Thomas Knösche (MPI Leipzig, DE)

- 17:00 **Modelling the human skull using FEM - effects of errors and simplifications** Thomas Knösche (MPI Leipzig, DE); Benjamin Lanfer (Institute for Biomagnetism and Biosignalanalysis & BESA GmbH, DE); Moritz Dannhauer (University of Utah, USA); Carsten H. Wolters (University of Münster, DE)
- 17:15 **Skull Defects in MEG and EEG: Experimental Results and Modelling**
Stephan Lau (Technical University Ilmenau & University of Melbourne & Biomagnetic Center Jena, DE); Daniel Güllmar (Jena University Hospital, DE); Lars Flemming (Friedrich-Schiller-University Jena, DE); Jens Haueisen (Technical University Ilmenau, DE)
- 17:30 **Influence of finite element discretization on the EEG/MEG forward solution in rabbits**
Hermann Sonntag; Jens Haueisen (Technical University Ilmenau, DE); Stephan Lau (Ilmenau Technical University & University of Melbourne & Biomagnetic Center Jena, DE); Roland Eichardt (Technical University Ilmenau, DE); Carsten H. Wolters; Johannes Vorwerk (University of Münster, DE); Lars Grasedyck (Institut für Geometrie und Praktische Mathematik (IGPM), DE); Daniel Güllmar (Jena University Hospital, DE)
- 17:45 **Comparison of direct and reciprocal forward modeling approaches in EEG source analysis**
Sven Wagner; Felix Lucka; Martin Burger (University of Münster, DE); Lars Grasedyck (RWTH Aachen University, DE); Jens Haueisen (Technical University Ilmenau, DE); Carsten H. Wolters (University of Münster, DE)
- 18:00 **Comparison of three- and single-shell volume conductor models in magnetoencephalography**
Matti Stenroos (MRC Cognition and Brain Sciences Unit & Aalto University, UK); Alexander Hunold; Roland Eichardt; Jens Haueisen (Technical University Ilmenau, DE)
- 18:15 **Electric field calculations in brain stimulation: The importance of geometrically accurate head models**
Axel Thielscher (MPI for Biological Cybernetics & Technical University of Denmark / Danish Research Center for MR, DE); Alexander Opitz (Georg-August-University of Göttingen, DE); Susanne Will (MPI for Biological Cybernetics, DK); Mirko Windhoff (MPI for Biological Cybernetics, DE)

19:00 Conference Opening • 20:30 Get TogetherRoom: **HS7** [Presentations in German] **Track Z****BMBF Session: Human-machine interaction in health care**

Chair: Kristina Hartwig (VDI/VDE Innovation + Technik GmbH, DE)

- 17:00 **Human-machine interaction and demographic change**
Kristina Hartwig; Monika Huber (VDI/VDE Innovation + Technik GmbH, DE)
- 17:15 **Web and app for prevention – virtual or real health?**
Anke Tempelmann (AOK Bundesverband, DE)
- 17:30 **Theranostic implants – opportunities and challenges**
Andreas Bunge (Biotronik SE & Co. KG, DE); Gerald Urban (Albert-Ludwigs-Universität Freiburg, DE)
- 17:45 **Operating room – where technology interacts with medical staff**
Jörg-Uwe Meyer (Mt2it, DE)
- 18:00 **Well cared for – therapy via long-distance relationship**
Stefan Hesse (Medical Park Berlin Humboldtmühle, DE)
- 18:15 **Patient care at home – living well in a familiar environment**
Stefen Weber-Carstens (Charité - Universitätsmedizin Berlin, DE)

19:00 Conference Opening • 20:30 Get Together

Room: HS1

Keynote 3

08:30 **Information from Graphical Analysis of HRV**
 Phyllis K. Stein (Washington University School of
 Medicine, USA)

Heart rate is controlled by a combination of sympathetic and parasympathetic inputs to the sinoatrial node and these inputs are regulated, in turn, by multiple feedback loops so that in a healthy person cardiac output is matched on a beat-to-beat basis with the demands of the body and is capable of changing very quickly in response to sudden changes. This has led to a simplistic assumption that numbers derived from intervals between heart beats (i.e., heart rate variability or HRV) always capture cardiac autonomic function only and that more is always healthier. Thus, calculations are usually made without any examination of the underlying patterns in the data. In this talk, I will cover various graphical methods for identifying normal and abnormal heart rate patterns that provide a more accurate way to examine and interpret HRV and also provide additional important clinical information, especially during sleep. These examples will be based on 24-hour Holter recordings and also on ECGs from overnight sleep studies, but even when HRV is calculated from short-term recordings, some graphical validation of the recordings should be performed to validate the data. The following graphical analyses will be covered in detail: Information from heart rate tachograms; information from 5-min averaged heart rate and HRV patterns; information from Poincaré plots; information from power spectral plots and integrating information from multiple HRV plots. Special emphasis will be placed on what normal patterns look like and how abnormal patterns in these different modes affect time domain, frequency domain and non-linear HRV analysis.

09:15 - 09:30 Break - Trade Exhibition

Room: HS1 [Presentations in English]

Track F

FS: Analysis of Oscillatory Brain Activity (1)

Chairs: Otto Witte (Friedrich Schiller University Jena, DE);
 Jens Haueisen (Technical University Ilmenau, DE)

- 09:30 **Anatomical substrate and generative mechanisms for brain oscillations**
 Thomas Knösche (MPI Leipzig, DE)
- 10:00 **Dynamic Causal Modelling for magneto- and electroencephalography**
 Stefan Kiebel (Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, DE)
- 10:20 **Modulating attentional states by EEG-based neurofeedback**
 Moritz Grosse-Wentrup (Max Planck Institute for Intelligent Systems, DE)
- 10:40 **Modulation of EEG oscillations via transcranial alternating current stimulation**
 Christoph S. Herrmann (Experimental Psychology Lab, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS2** [Presentations in German] **Track S**

Intelligent Implants: Clinical Research and Approval

Chairs: Johannes Dehm (VDE Verband der Elektrotechnik Elektronik Informationstechnik e. V., DE); Cord Schlötelburg (VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V. & DGBMT Deutsche Gesellschaft für Biomedizinische Technik im VDE, DE)

09:30 **The Technology Navigator Intelligent Implants - Yellow Pages for Developer**
Klaus-Peter Hoffmann (Fraunhofer Institute for Bio-medical Engineering & IBMT, DE)

10:00 **Clinical Trials with Intelligent Implants**
Xina Graehlert (Technische Universität Dresden, DE)

10:30 **Approval of Intelligent Implants**
Hartmut Ritscher (TÜV Süd, DE)

Room: **HS3** [Presentations in English/German] **Track B**

Optical Imaging

Chairs: Edmund Koch (Technische Universität Dresden, DE)

09:30 **Four-dimensional optical coherence tomography imaging of subpleural alveoli in mice**
Lars Kirsten; Maria Gaertner; Christian Schnabel (University of Technology Dresden, DE); Sven Meissner (University of Technology Dresden & Medical Faculty Carl Gustav Carus, DE); Edmund Koch (University of Technology Dresden, DE)

09:45 **Generating extended images of the corneal nerve plexus by guided eye movements**
Bernd Köhler; Stephan Allgeier; Franz Eberle; Klaus-Martin Reichert (Karlsruhe Institute of Technology (KIT), DE); Oliver Stachs (Universität Rostock, DE); Georg Bretthauer (Karlsruhe Institute of Technology (KIT), DE)

10:00 **Calibration of immunofluorescence: a standardization approach**
Vishnu Prasad Ravitla (Martin Luther University and FH Anhalt & Medipan GmbH, DE); Boris Radau (Medipan GmbH, DE); Golam Abu Zakaria (Gummersbach Hospital, DE)

10:15 **Comparison of Laser Speckle Flowmetry and Intrinsic Optical Signal Imaging in Gyrencephalic Swine Brain during Cortical Spreading Depolarisations**
Michael Schöll (University of Heidelberg, DE); Markus Gramer (Max Planck Institute for Neurological Research, DE); Edgar Santos; Modar Kentar; Renán Sánchez-Porras; Zelong Zheng; Oliver Sakowitz (Heidelberg University Hospital, DE); Rudolf Graf (Max Planck Institute for Neurological Research, DE); Hartmut Dickhaus (University of Heidelberg, DE)

10:30 **System development for Spectroscopic Optical Coherence Tomography**
Volker Jaedicke; Semih Agcaer (Ruhr Universität Bochum, DE); Sebastian Goebel; Helge Wiethöf (Technische Fachhochschule Georg Agricola Bochum, DE); Nils Gerhardt (Ruhr-Universität Bochum, DE); Hubert Welp (Technische Fachhochschule Georg Agricola Bochum, DE); Martin Hofmann (Ruhr-Universität Bochum, DE)

- 10:45 **Signal Processing for Spectroscopic Optical Coherence Tomography**
Sebastian Goebel (Technische Fachhochschule Georg Agricola Bochum, DE); Semih Agcaer; Volker Jaedicke; Nils Gerhardt (Ruhr-Universität Bochum, DE); Hubert Welp (Technische Fachhochschule Georg Agricola Bochum, DE); Martin Hofmann (Ruhr-Universität Bochum, DE)

Room: HS4 [Presentations in German] **Track** 

Modeling and Simulation of Brain and Heart

Chairs: Martin W. Krueger (Karlsruhe Institute of Technology (KIT), DE); Carsten H. Wolters (University of Münster, DE)

- 09:30 **Volume conduction effects in tDCS using a 1mm geometry-adapted hexahedral finite element head model**
Sven Wagner (University of Münster, DE); Sumientra Rampersad (Radboud University Nijmegen Medical Centre, DE); Ümit Aydın; Johannes Vorwerk (University of Münster, DE); Toralf Neuling; Christoph S. Herrmann (Experimental Psychology Lab, DE); Dick Stegeman ((314), University Medical Centre Nijmegen, NL); Carsten H. Wolters (University of Münster, DE)
- 09:45 **A Variational Bayesian Approach to Brain Source Localization**
Ralph Tandetzky (Invitronic GmbH, DE); Thomas Jochmann (Ilmenau University of Technology, Ilmenau & Invitronic GmbH, DE)
- 10:00 **Simulating the Beating Heart within the Pericardium using Finite Element Analysis**
Thomas Fritz; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 10:15 **Modelling of Heterogeneous Human Atrial Electrophysiology**
Andreas Dorn; Martin W Krueger; Gunnar Seemann; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- 10:30 **Soundcard based Multichannel Live-ECG Simulator for Research, Development and Education**
Johannes Koebele (Offenburg University of Applied Sciences, DE); Matthias Heinke (University of Jena, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE)

Room: HS5 [Presentations in English] Track E

Biosensors and Bioanalytics (1)

Chairs: Martin Stelzle (NMI Natural and Medical Sciences Institute at the University of Tuebingen, DE);

Gerald Urban (Albert-Ludwigs-Universität Freiburg, DE)

- 09:30 **Microring resonator arrays for label-free biochemical multi-parameter analysis**
Daniel Pergande; Peter Lützow; Dominik Gausa; Helmut Heidrich (Fraunhofer Heinrich Hertz Institut, DE)
- 09:45 **Characterization of Atherosclerotic Plaque Depositions in vivo by Fiber-Optic Raman Spectroscopy and ex vivo by FTIR, Raman and Non-Linear Imaging Techniques**
Christian Matthäus (Institute of Photonic Technology Jena, DE)
- 10:00 **Wavelength Modulated Raman Spectroscopy for Biomedical Applications**
Sebastian Dochow; Norbert Bergner; Christoph Krafft (Institute of Photonic Technology Jena, DE); Joachim Clement (Friedrich-Schiller-Universität Jena, DE); Michael Malizu; Bavishna Balagopal; Rob Marchington; Kishan Dholakia (University of St. Andrews, UK); Jürgen Popp (Institut of Photonic Technology Jena, DE)
- 10:15 **Microstructured optical fibre as biosensor for pathogen detection on DNA-level**
Barbara Seise; Andrea Csaki; Anka Schwuchow; Wolfgang Fritzsche (Institute of Photonic Technology Jena, DE); Karina Weber; Dana Cialla (Friedrich Schiller University Jena, DE); Jürgen Popp (Institute of Photonic Technology Jena, DE)
- 10:30 **Automated universal chip platform for fluorescence based cellular assays**
Florian Schmieder; Stefan Schmieder; Rene Eger (Fraunhofer Institut für Werkstoff- und Strahltechnik IWS Dresden, DE); Sandra Friedrich; Anett Werner (TU Dresden, DE); Norbert Danz (Fraunhofer Institute Applied Optics and Precision Engineering (IOF), DE); Uwe Marx (TissUse GmbH, DE); Frank Sonntag (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE)

Room: HS6 [Presentations in English] Track L

New Development in Unobstructive Monitoring

Chairs: Jens Mühlsteff (Philips Research Europe, DE); Gerhard Staude (University FAF Munich, DE)

- 09:30 **Direct modulation of pulse oximetry probe light signals using a digital micromirror array for instrumental calibration of optical sensors**
Benjamin Weber; Stefan Marx (Luebeck University of Applied Sciences, DE); Hartmut Gehring (University of Luebeck & Universitätsklinikum Schleswig-Holstein, DE); Bodo Nestler (Luebeck University of Applied Sciences, DE)
- 09:45 **Mobile R-Wave Detection System Powered By a Thermoelectric Generator**
Johannes Miersch; Simon Beckmann; Fabian Engler; Katharina Simmen; Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)
- 10:00 **On-line Learning Algorithms for extracting respiratory activity from Single Lead ECGs based on Principal Component Analysis**
Maik Pflugradt; Steffen Mann; Viktor Feller; Reinhold Orglmeister (Technische Universität Berlin, DE)
- 10:15 **A new catheterless urodynamics measurement method by using an intravesical capsule**
Jenny Hamacher (Universitätsklinik Köln, DE); Dirk Tenholte (Technische Universität Chemnitz, DE); Pauline Schumacher; Noemi Muthen (Universitätsklinik Köln, DE); Jan Mehner (Technische Universität Chemnitz, DE); Udo Engelmann; Sebastian Wille (Universitätsklinik Köln, DE)
- 10:30 **Ventilation inhomogeneity in patients with cystic fibrosis measured by electrical impedance tomography**
Zhanqi Zhao (Furtwangen University, DE); Rainald Fischer; Ullrich Müller-Lisse (University of Munich, DE); Knut Moeller (Furtwangen University, DE)
- 10:45 **An unobtrusive ambulatory knee function monitoring system using wearable inertial sensors**
Mareike Schulze; Christopher Lammel; Tsung-Han Liu; Tilman Calliess; Raphael Bocklage; Frank Seehaus (Hannover Medical School, DE); Matthias Gietzelt (PLRI, DE); Klaus-Hendrik Wolf (Technische Universität Braunschweig, DE); Henning Windhagen (Hannover Medical School, DE); Michael Marscholke (Peter L. Reichertz Institut TU Braunschweig und MHH, DE)

Room: **HS7** [Presentations in English] **Track H**

Endoscopy

Chairs: Jörg-Uwe Meyer (Mt2it, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)

- 09:30 **Chip-on-the-Tip Medical Wireless Stereo Endoscope**
 Martin Kelp; Bastian Blase; Daniel Brüggemann; Robert Dreyer genannt Daweke; Heinz Lehr; Stefan Oginski; Sebastian Schlegel (Technical University Berlin, DE)
- 09:45 **EndoMediskop – Trans-Endoscopic Microinjection for Flexible Endoscopy**
 Klaus Mutschler (University of Freiburg, DE); Wolfgang Juergen Kunert; Regina Ingenpass (University Hospital Tübingen, DE); Karl Ernst Grund (Universität Tübingen, DE); Laurent Tanguy (University of Freiburg, DE); Andreas Ernst (University of Freiburg & BioFluidix GmbH, DE); Roland Zengerle (Universität Freiburg & HSG-IMIT, DE); Peter Koltay (Universität Freiburg, DE)
- 10:00 **Medical LED-on-the-Tip endoscope**
 Daniel Brüggemann; Bastian Blase; Florian Bühs; Robert Dreyer genannt Daweke; Martin Kelp; Heinz Lehr; Stefan Oginski; Sebastian Schlegel (Technical University Berlin, DE)
- 10:15 **Autoclavable Flexible Endoscopes for Natural Orifice Transluminal Endoscopic Surgery (NOTES) Applications**
 Matthias Kuehn; Stefan Schroeer; Claas Mueller; Holger Reinecke (University of Freiburg, DE)
- 10:30 **Miniaturized Instrument-Mounted Navigation System**
 Florian Coigny (University of Applied Sciences Northwestern Switzerland, CH); Philipp Jürgens; Jörg Beinemann (University-Hosp. Basel, CH); Bruno Knobel (Naviswiss AG, CH); Erik Schkommodau (University of Applied Sciences Northwestern Switzerland, CH)

Room: **HS8** [Presentations in German] **Track Q**

FS: New Biomedical Engineering Perspectives in Cardiac Pacing and Ablation

Chairs: Matthias Heinke (University of Jena, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE); Helmut Kuehnert (University of Jena, DE); Juraj Melicherik (MediClin Herzzentrum Lahr, DE)

- 09:30 **New frontiers of supraventricular tachycardia and atrial flutter evaluation and catheter ablation**
 Helmut Kuehnert; Hans Reiner Figulla (University of Jena, DE); Bruno Ismer (University of Rostock, DE); Matthias Heinke (University of Jena, DE)
- 09:45 **Focused transesophageal left atrial and left ventricular pacing with different pacing mode for supraventricular tachycardia initiation and cardiac resynchronization therapy simulation**
 Matthias Heinke (University of Jena, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE); Helmut Kuehnert (University of Jena, DE); Juraj Melicherik (MediClin Herzzentrum Lahr, DE); Tobias Heinke (Siemens AG Healthcare Sector, Rudolstadt, DE); Ralf Surber; Gudrun Dannberg; Dirk Prochnau; Hans Reiner Figulla (University of Jena, DE)
- 10:00 **High-resolution semi-invasive left heart electrocardiography in cardiac pacing and cardiac resynchronization therapy**
 Bruno Ismer (Offenburg University of Applied Sciences, DE); Juraj Melicherik (MediClin Herzzentrum Lahr, DE); Matthias Heinke (University of Jena, DE)
- 10:15 **New frontiers in the evaluation and treatment of patients with atrial fibrillation**
 Juraj Melicherik (MediClin Herzzentrum Lahr, DE)
- 10:30 **Novel RF generator, remote control and irrigation pump technology to provide maximum safety and control in cardiac catheter ablation**
 Andreas Berns (Stockert GmbH, Freiburg, DE)
- 10:45 **What range of pace-sense-compensation should be provided in biventricular pacing systems for heart failure?**
 Daisy Gebhardt; Frauke Schmid (Offenburg University of Applied Sciences, DE); Frank Weber (Euregio-Klinik Nordhorn, DE); Matthias Heinke (University of Jena, DE); Ina Ennker; Juraj Melicherik (MediClin Herzzentrum Lahr, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE)

Room: **HS1** [Presentations in English] **Track F**

FS: Analysis of Oscillatory Brain Activity (2)

Chairs: Lutz Leistritz (Friedrich Schiller University Jena, DE); Daniel Strohmeier (Ilmenau University of Technology, DE)

11:30 **Complex Synchronization and Recurrence Analyses – re such Nonlinear Techniques Useful for Brain Oscillation Studies?**

Juergen Kurths (Humboldt University, DE)

12:00 **Inference of time-dependent causal influences in Networks**

Malenka Killmann (University Medical Center of Freiburg & University of Freiburg, DE); Linda Sommerlade; Wolfgang Mader; Jens Timmer; Björn Schelter (University of Freiburg, DE)

12:20 **MEG/EEG single trial source estimates based on inter-trial priors in the time-frequency domain for source connectivity analysis**

Daniel Strohmeier (Ilmenau University of Technology, DE); Matthieu Kowalski (Université Paris-Sud, Orsay, FR); Jens Haueisen (Ilmenau University of Technology, DE); Matti S Hämäläinen (MGH Hospital, USA); Alexandre Gramfort (INRIA Saclay Ile-de-France, FR)

12:40 **Combining EEG and eye tracking: Identification, characterization and correction of eye movement artifacts in electroencephalographic data**

Peter König; Michael Plöchl; Jose Ossandón (University of Osnabrück, DE)

Room: **HS2** [Presentations in German] **Track S**

FS: REMEDIS – Enhanced quality of life through novel microimplants

Chairs: Klaus-Peter Schmitz, Katrin Sternberg (Universität Rostock, DE)

11:30 **Additive Manufacturing of Drug Delivery Systems**

Matthias Gieseke (Laser Zentrum Hannover e.V., DE); Volkmar Senz; Mark Vehse; Steffen Fiedler; Robert Irsig (Universität Rostock, DE); Michael Hustedt (Laser Zentrum Hannover e.V., DE); Katrin Sternberg (Universität Rostock, DE); Christian Nölke; Stefan Kaierle; Volker Wesling (Laser Zentrum Hannover e.V., DE); Josef Tiggesbäumker; Karl-Heinz Meiwes-Broer; Hermann Seitz; Klaus-Peter Schmitz (Universität Rostock, DE); Heinz Haferkamp (Laser Zentrum Hannover e.V., DE)

11:45 **In vitro estimation of drug loss during the implantation procedure of drug-eluting stents**

Anne Seidlitz; Stefan Nagel; Beatrice Semmling (Ernst-Moritz-Arndt-Universität Greifswald, DE); Svea Petersen; Thomas Reske; Wolfram Schmidt; Niels Grabow; Katrin Sternberg (Universität Rostock, DE); Werner Weitschies (Ernst-Moritz-Arndt-Universität Greifswald, DE)

12:00 **Tailored design of implant surfaces by modification with elastin-like proteins**

Svea Petersen (University of Rostock, DE); Güven Kurtbay (University of Greifswald, DE); Maria Boeck (University of Rostock, DE); Heyo K. Kroemer (Ernst-Moritz-Arndt-Universität Greifswald, DE); Klaus-Peter Schmitz (University of Rostock, DE); Henriette Meyer zu Schwabedissen (Ernst-Moritz-Arndt-Universität Greifswald, DE); Katrin Sternberg (University of Rostock, DE)

12:15 **Implant-associated local drug delivery systems for different medical applications**

Katrin Sternberg; Svea Petersen; Niels Grabow; Frank Luderer; Anne Bohl; Thomas Reske; Stefan Siewert; Ingo Minrath (University of Rostock, DE); Anne Seidlitz; Werner Weitschies; Henriette Meyer zu Schwabedissen; Heyo K. Kroemer (Ernst-Moritz-Arndt-Universität Greifswald, DE); Klaus-Peter Schmitz (Universität Rostock, DE)

12:30 **Drug delivery system for sustained delivery of caffeic acid phenethyl ester within lens capsule after cataract surgery**

Barbara Dittrich; Birgit Koch (DWI an der RWTH Aachen e.V., DE); Theo van Kooten (UMCG, NL); Christian Kastner (Universität Rostock, DE); Rudolf Guthoff (Universität Rostock & Universitätsaugenklinik Rostock, DE); Katrin Sternberg (Universität Rostock, DE); Martin Möller (RWTH Aachen, DE)

Room: HS4 [Presentations in German] **Track** **O**

FS: automation in medical technology

Chairs: Thomas Schauer (Technische Universität Berlin, DE); Olaf Simanski (Hochschule Wismar, DE)

11:30 **Modeling of the blood sugar in diabetic large animal models**

Steffen Leonhardt (RWTH Aachen, DE)

11:45 **Continuous blood pressure measurement with ultrasound**

Sarah Weber; Daniel Strommenger; Ulrich Kertzsch; Klaus Affeld (Charité - Universitätsmedizin Berlin, DE)

12:00 **Multivariate biosignal acquisition to assess the potential of remote photoplethysmography**

Sebastian Zaunseder (Dresden University of Technology, DE); Tom Wirthgen (Fraunhofer Institute for Transportation and Infrastructure Systems, DE); Georg Lempe; Hagen Malberg (Dresden University of Technology, DE); Stephan Zipser (Fraunhofer Institute for Transportation and Infrastructure Systems, DE)

12:15 **Development of a test-bench for bio-inspired actuator systems in rehabilitation robotics**

Kurt Gerlach-Hahn; Berno Misgeld; Steffen Leonhardt (RWTH Aachen University, DE)

12:30 **Iteratively Learning Electromyography (EMG)-based Functional Electrical Stimulation (FES) for Stroke Rehabilitation**

Octavian Lupu (Technische Universität Berlin, DE); Matteo Madaschi (University of Bergamo, IT); Thomas Seel (Technische Universität Berlin, DE); Alberto Cologni; Fabio Previdi (University of Bergamo, IT); Thomas Schauer (Technische Universität Berlin, DE)

12:45 **Patient Safety and Human Factors Research for Surgical Automation**

Werner Korb (Leipzig University of Applied Sciences, DE)

Room: **HS5** [Presentations in German] **Track E**

Biosensors and Bioanalytics (2)

Chairs: *Andreas Guber (KIT - Karlsruher Institut für Technologie, DE)*

11:30 **BioMEMS for Processing and Testing of Hydrogel-Based Bio-Interfaces**

Mike Stubenrauch; Robert Fischer (Ilmenau University of Technology, DE); Ulrike Fröber (Carl Zeiss Microlmaging GmbH, DE); Hartmut Witte (Ilmenau University of Technology, DE)

11:45 **Microfluidic polycarbonate chip for long-term cell analyses**

Kristina Kreppenhofer; Chorong Kim; Marc Schneider; Dirk Herrmann; Ralf Ahrens; Jubin Kashef; Dietmar Gradl; Doris Wedlich; Andreas Guber (Karlsruhe Institute of Technology (KIT), DE)

12:00 **Laser induced surface structure on stainless steel influences cell viability**

Mark Vehse; Marian Löbler; Klaus-Peter Schmitz; Hermann Seitz (Universität Rostock, DE)

12:15 **Biomolecular interaction analysis based on a tetraether lipid matrix**

Christian Bücher (Institute for Bioprocessing and Analytical Measurement Techniques, DE)

12:30 **Laser structuring of silica surface improves cell adhesion**

Marian Löbler; Mark Vehse; Hermann Seitz; Klaus-Peter Schmitz (Universität Rostock, DE)

Room: **HS6** [Presentations in German] **Track L**

FS: How much monitoring does a patient need?

Chairs: *Jens Muehlsteff (Philips Research, NL); Gerhard Staude (University FAF Munich, DE)*

11:30 **Patient Monitoring: Definition, Trends, Visions**
Gerhard Staude (University FAF Munich, DE)

11:45 **Monitoring in OR and ICU - How much monitoring does a patient need?**

Martin Grossherr (Universitätsklinikum Schleswig-Holstein, DE)

12:00 **Monitoring on General Ward - an Unmet Need?**

Tobias Wartzek; Steffen Leonhardt (RWTH Aachen University, DE)

12:15 **Outpatient Monitoring**

Martin Braecklein (Robert Bosch Healthcare GmbH, DE)

12:30 **Emerging Technologies in Patient Monitoring**

Jens Muehlsteff (Philips Research, NL); Idowu B.I Ayoola (Technical University Eindhoven, NL)

12:45 **Outcome Studies in Patient Monitoring**

Michael Imhoff (Ruhr-University Bochum, DE)

Room: **HS7** [Presentations in German] **Track H****Surgical Instruments, Devices & Procedures**

Chairs: Jörg-Uwe Meyer (Mt2it, DE), Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)

- 11:30 **Reduction of thermal tissue damage caused by bipolar radiofrequency-induced thermofusion**
 Matthias Kröger; Annika Jaenicke; Hanno Winter (Technische Universität Berlin, DE); Alexandra Nagel; Heinz-Johannes Buhr (Charité - Universitätsmedizin Berlin, DE); Jörg-Peter Ritz (Helios Kliniken, DE); Roland Lauster; Marc Kraft (Technische Universität Berlin, DE); Christoph Holmer (Charité - Universitätsmedizin Berlin, DE)
- 11:45 **A fully functional prototype for establishing electro-chemotherapy in interstitial usage**
 Andreas Ritter; Martin Baumann; Philipp Bruners; Jochen Pfeffer; Thomas Schmitz-Rode; Andreas H. Mahnken (RWTH Aachen University, DE)
- 12:00 **Online measurement and evaluation of the Er:YAG laser ablation process using an integrated OCT system**
 Alexander Fuchs (Leibniz Universität Hannover, DE); Michael Schultz (Medical University of Hannover & Laser Zentrum Hannover e.V., DE); Alexander Krüger (Laser Zentrum Hannover e.V., DE); Dennis Kundrat; Jesus Díaz Díaz; Tobias Ortmaier (Leibniz Universität Hannover, DE)
- 12:15 **Force measurement at the insertion process of cochlear implant electrodes**
 Omid Majdani (Hannover Medical School, DE); Jan-Philipp Kobler; Daniel Beckmann; Tobias Ortmaier (Leibniz Universität Hannover, DE); Thomas Lenarz; Thomas S. Rau (Hannover Medical School, DE)
- 12:30 **Impact of selective surgical pelvic autonomic nerve damage on the evoked neuromonitoring signal of the internal anal sphincter**
 Daniel W Kauff (University Medicine Mainz, DE); Klaus Peter Koch (University of Applied Sciences Trier, DE); Oliver Kempfski (University Medicine Mainz, Algeria); Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering, DE); Hauke Lang; Werner Kneist (University Medicine Mainz, DE)
- 12:45 **Muscle Protection in Cardiac Bioassist: Experimental Results with the Microstim MyoSen™ muscle stimulator**
 Peter Klapproth; Markus Eckhardt; Torben Hiller; Sergey Tarassenko; Stephanie Söllner; Stefan Sachs (Microstim GmbH, DE); Roza Saraei; Norbert Guldner (University Hospital Schleswig-Holstein, DE)

13:00 - 14:00 Lunch break - Trade Exhibition - RecruitingRoom: **HS8** [Presentations in German] **Track J****Patient Safety and Medical Devices – presentations of Haindl awardees**

Chair: Uvo M. Hölscher (Münster University of Applied Sciences, DE)

13:00 - 14:00 Lunch break - Trade Exhibition - Recruiting

Room: HS1

Keynote 4

14:00 **Transcatheter Heart Valve Replacement: Technical Innovations in the Interest of the patient.**
Hans Reiner Figulla (University of Jena, DE)

2002 wurde erstmalig bei einem Erwachsenen mit Aortenklappenstenose perkutan, d.h. durch Punktion der Leistengefäße, mittels eines Katheters die Implantation einer Aortenklappe vorgenommen (TAVI). Nach weiteren technischen Verbesserungen wurden 2007 zwei Herzklappenmodelle (Cribier Edwards, CoreValve) CE-zertifiziert und in den Europäischen Markt eingeführt. Das Verfahren, welches für die klassische Operation bei Patienten mit hohem OP-Risiko bei alten Patienten als Alternative zur Verfügung steht, erfreut sich großer Akzeptanz insbesondere in Deutschland, so dass Deutschland gegenwärtig der weltweit größte Markt ist. 2011 wurden ca. 4.000 perkutane Aortenklappenimplantationen in Deutschland durchgeführt, d.h. 28% aller Aortenklappeneingriffe. Randomisierte Studien zeigen, dass dies TAVI-Verfahren bei Hochrisikopatienten auch nach drei Jahren der Operation ebenbürtig ist. Neue Studien sind konzipiert, um das TAVI-Verfahren alternativ zur klassischen Operation auch bei Patienten zu prüfen, die ein niedriges Operationsrisiko aufweisen. 2011 sind zwei weitere Herzklappenmodelle in den Europäischen Markt eingeführt worden, wobei insbesondere die in Jena konzipierte Klappe (JenaValve) sich großer Akzeptanz bei der Applikation durch die Herzspitze erfreut. Es ist davon auszugehen, dass technische Verbesserungen und die Ergebnisse der o.g. weiteren Studien die klassische chirurgische Operation durch die perkutane Aortenklappenimplantation in den nächsten Jahren abgelöst wird.

Aufgrund des Durchbruchs mit perkutanen Klappen im Bereich der Aortenposition gibt es weltweite Forschungsaktivitäten, um die perkutanen Klappen auch in anderen Positionen des Herzens einzubringen. In Jena wurden die weltweit ersten heterotopen Trikuspidalklappenimplantationen durchgeführt, Forschungsprojekte zur Entwicklung einer perkutanen implantierbaren Mitralklappe sind im Gang. Perkutane Implantationen zum Ersatz der Pulmonalklappe sind ebenfalls in den Bereich der klinischen Praxis eingezogen, sie erübrigen bei voroperierten Patienten die Re-Operation.

Die klinischen Studien zeigen, dass mittels perkutan implantierbaren Herzklappen, die den Patienten weniger belasten, neue Verfahren zur Verfügung stehen, die eine schnellere Rehabilitation und geringere Risiken aufweisen. Die großen Erfolge dieser revolutionären Verfahren wurden möglich durch technische Entwicklungen von Kathetern, Stents, Herzklappen, Gefäßzugangsschleusen, verbesserter Röntgenbild- und Ultraschallbildtechnik und Teambildung zwischen Kardiologen und Herzchirurgen.

Posters

Track B

Imaging and Image Processing

- B1 **Micro camera based Lensless Microscope for a miniaturized diagnostic platform**
Erik Jung (Fraunhofer-IZM & SIIT, DE); Moritz Hubl (Fraunhofer IZM, DE)
- B2 **Improvement of neuronavigation based on ultrasound by means of the digital video interface**
Andrea Müns (University of Leipzig, DE); Sven Arnold; Arno Schmitgen (Localite GmbH, DE); Claire Chalopin; Felix Artl (University of Leipzig, DE); Jürgen Meixensberger; Dirk Lindner (Universitätsklinikum Leipzig, DE)
- B3 **Automated high throughput image analysis of the ND10 complex of KSHV cells**
Christian Held; Veit Wiesmann (Fraunhofer Institute for Integrated Circuits IIS, DE); Doris Lengenfelder; Florian Full (University Hospital Erlangen, DE); Ralf Palmisano (University Erlangen, DE); Armin Ensser (University Hospital Erlangen, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)
- B4 **Determining Noise Distribution in Computed Tomography - A Simple Phantom Based Approach**
Christian Kaethner; Jan Müller; Thorsten M. Buzug (University of Luebeck, DE)
- B5 **Low Field set-up for Magnetic Resonance Imaging**
Stefan Hartwig; Martin Burghoff; Hans-Helge Albrecht; Hans-Juergen Scheer (Physikalisch-Technische Bundesanstalt, DE); Ingo Hilschenz (University of Leipzig, DE); Nora Hoefner; Rainer Körber (Physikalisch-Technische Bundesanstalt, DE); Antonino M. Cassarà (Museo Storico della Fisica e Centro Studi e Ricerche "E. Fermi" & e/o University "La Sapienza", IT); Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)
- B6 **Information Fusion of Image Analysis, Video Object Tracking, and Data Mining of Biological Images using the Open Source MATLAB Toolbox Gait-CAD**
Johannes Stegmaier; Rüdiger Alshut; Markus Reischl; Ralf Mikut (Karlsruhe Institute of Technology (KIT), DE)
- B7 **Vision-based Hand Representation and Intuitive Virtual Object Manipulation in Mixed Reality**
Felix Bach; Hueseyin Kemal Çakmak; Heiko Maaß (Karlsruhe Institute of Technology (KIT), DE)

- B8 Towards Segmentation of the Upper Abdomen using a Multi-Object Active Shape Model**
Sebastian T. Gollmer (Universität zu Lübeck, DE); Martin Simon (University Medical Center Schleswig-Holstein, DE); Arpad Bischof (IMAGE Information Systems Ltd., UK); Joerg Barkhausen (University Hospital Schleswig-Holstein, DE); Thorsten M. Buzug (Universität zu Lübeck, DE)
- B9 A novel low-noise system for non-invasive high-frequency EEG recordings**
Tommaso Fedele (Charité – University Medicine, DE); Hans-Juergen Scheer; Martin Burghoff (Physikalisch-Technische Bundesanstalt, DE); Gabriel Curio (Charité-Universitätsmedizin Berlin, DE)
- B10 Brain tumor enhancement revealed by 3D intraoperative ultrasound imaging in a navigation system**
Claire Chalopin; Rene Lindenberg; Felix Art; Andrea Müns (University of Leipzig, DE); Jürgen Meixensberger; Dirk Lindner (Universitätsklinikum Leipzig, DE)
- B11 Motion Capture Camera System for Measurement of Head and Shoulders Position**
Jan Hejda; Patrik Kutilek; Jiri Hozman (Czech Technical University in Prague, CZ); Rudolf Cerny (Charles University in Prague, 2nd, CZ)
- B12 Concept for tremor stabilization in OCT-based Laryngoscopy**
Sabine Donner; Tammo Ripken; Alexander Krüger (Laser Zentrum Hannover e.V., DE)
- B13 Particle Mobility in Magnetic Particle Imaging**
Thilo Wawrzik; Christian Kuhlmann; Frank Ludwig; Meinhard Schilling (Technische Universität Braunschweig, DE)
- B14 Simulative Assessment of Radiation Exposure for Freely Definable CBCT X-ray Source Trajectories**
Fabian Stopp (Charité - Universitätsmedizin Berlin, DE); Marc Käseberg; Sebastian Engel; Christian Winne; Felix Fehlhaber (Fraunhofer-Institute for Production Systems and Design Technology IPK, DE); Erwin Keeve (Charité - Universitätsmedizin Berlin, DE)

- B15 Simulation of Clinical Applications for Intraoperative CBCT System Concepts**
Marc Käseberg (Fraunhofer-Institute for Production Systems and Design Technology IPK, DE); Fabian Stopp (Charité - Universitätsmedizin Berlin, DE); Sebastian Engel; Felix Fehlhaber (Fraunhofer-Institute for Production Systems and Design Technology IPK, DE); Erwin Keeve (Charité - Universitätsmedizin Berlin, DE)
- B16 Software development for the determination of susceptibility artefacts in MRI after ASTM F2119**
Felix Güttler; Andreas Heinrich; Ulf Teichgräber (Jena University Hospital, DE)
- B17 Automated image analysis of immunohistochemical stained brain slices after long term polyimide brain implants**
Paula Klimach (University of Luebeck, DE); Anja Richter (Fraunhofer EMB, DE); Sandra Danner; Charli Kruse (Fraunhofer Gesellschaft, DE); Volker Tronnier (University Hospital Schleswig-Holstein (UKSH), Campus Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- B18 Potential applications of the completely automated BrainAGE framework using structural MRI**
Katja Franke; Christian Gaser (Jena University Hospital, DE)
- B19 UWB microwave imaging of heterogeneous breast phantoms**
Marko Helbig (Ilmenau University of Technology, DE); Katja Dahlke; Ingrid Hilger (Jena University Hospital, DE); Martin Kmec; Jürgen Sachs (Ilmenau University of Technology, DE)
- B20 3D Characterization of Texture: Evaluation for the Potential Application in Mammographic Mass Diagnosis**
Florian Wagner; Alexander Gryanik (Fraunhofer Institute for Integrated Circuits IIS, DE); Rüdiger Schulz-Wendtland (Universität Erlangen-Nürnberg, DE); Peter Fasching (University Hospital Erlangen, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)

- B21 **Automatic Image Quantification for Structural Analysis of in vitro Dermal Samples**
Alexander Gryanik; Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE); Heike Walles (University of Würzburg, DE); Sybille Thude; Michaela Kaufmann (Fraunhofer IGB, DE); Dirk G Steckhan; Christian Münzenmayer (Fraunhofer Institute for Integrated Circuits IIS, DE)
- B22 **Determination of Iron Oxide Concentrations in Ferrofluids using a Micro-CT Phantom**
Christina Debbeler; Jan Müller; Kerstin Lütke-Buzug (University of Luebeck, DE)
- B23 **Automation of model generation for numerical simulations based on computed tomography**
Enrico Mick (University Medicine Rostock, DE); Robert Souffrant; Daniel Kluess; Wolfram Mittelmeier; Rainer Bader (Universität Rostock, DE)
- B24 **From Infection to Detection: Imaging S. aureus - host interactions**
Ute Neugebauer; Christina Große; Michael Bauer (Jena University Hospital, DE); Björn Kemper; Álvaro Barroso-Pena; Andreas Bauwens; Malte Glueder; Mike Woerdemann; Lena Dewenter; Cornelia Denz (University of Münster, DE); Sandra Kloß (University Jena, DE); Petra Rösch (Friedrich-Schiller-University, DE); Artur Sabat (University Medical Centre Groningen, EurSafety Health-net, NL); Karin Schütze (Celltool GmbH, Tutzing, DE); Alexander Friedrich (University Medical Centre Groningen, NL); Gerd von Bally (University of Münster, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE); Alexander Mellmann (University of Münster, Münster, DE)
- B25 **Smart Instrumentation for Mobile Diagnosis and Quality Assurance in Industry, Biology and Medicine**
Dietrich Hofmann; Paul-Gerald Dittrich; Eric Düntsch; Daniel Kraus (Technology- and Innovation Park Jena GmbH, DE)
- B26 **Functional T2 weighted MRI for investigation of muscle fatigue in the lower back muscles**
Patrick Hiepe; Reinhard Rzanny; Alexander Gussew; Christoph Anders; Hans-Christoph Scholle; Jürgen R. Reichenbach (Jena University Hospital, DE)
- B27 **Functional diffusion weighted MRI for assessment of muscle fatigue in the lower back muscles**
Patrick Hiepe; Reinhard Rzanny; Alexander Gussew; Christoph Anders; Hans-Christoph Scholle; Jürgen R. Reichenbach (Jena University Hospital, DE)

- B28 **A Method for Validation and Evaluation of Digital Tomosynthesis Reconstruction**
Aileen Cordes; Yulia M. Levakhina; Thorsten M. Buzug (University of Lübeck, DE)
- B29 **An Application Scenario for Single-Sided Magnetic Particle Imaging**
Ksenija Gräfe; Timo F Sattel; Kerstin Lütke-Buzug (University of Lübeck, DE); Dominique Finas (University of Lübeck & Evangelisches Krankenhaus Bielefeld, DE); Joern Borgert (Philips Technology GmbH, DE); Thorsten M. Buzug (University of Lübeck, DE)
- B30 **A hybrid imaging system for simultaneous ophthalmic optical coherence tomography and dual-channel fluorescence detection in small animal models**
Peter Cimalla; Maria Gaertner; Stefan Geissler; Mirko Mehner; Edmund Koch (University of Technology Dresden, DE)
- B31 **Segmentation of HeLa cells in phase-contrast images with and without support of DAPI stained cell nuclei**
Veit Wiesmann; Christian Held (Fraunhofer Institute for Integrated Circuits IIS, DE); Ralf Palmisano (University Erlangen, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)
- B32 **Triangulating Quadrilaterals on the Sphere: Application to Shape Analysis**
Sebastian T Gollmer; Thorsten M. Buzug (Universität zu Lübeck, DE)
- B33 **Phantom for Evaluation of Intraoperative Optical Imaging Setup**
Martin Oelschlägel; Tobias Meyer; Stephan Sobottka (Dresden University of Technology, DE); Matthias Kirsch (Universitätsklinikum Dresden, DE); Gabriele Schackert; Ute Morgenstern (Dresden University of Technology, DE)
- B34 **In-vitro evaluation of contrast media for assessment of regional perfusion distribution by Electrical Impedance Tomography (EIT)**
Niels Hellige; Bernhard Meyer; Thomas Rodt; Jens Vogel-Claussen (Medizinische Hochschule Hannover, DE); Günter Hahn; Gerhard Hellige (Universitätsmedizin Göttingen UMG, DE)
- B35 **Calculation of Reconstruction Kernels in Computed Tomography**
Jan Müller; Thorsten M. Buzug (University of Luebeck, DE)

- B36 **Quantitative fibre bundle-based analysis of diffusion-weighted MRI data**
Christian Ros; Daniel Güllmar; Martin Stenzel; Hans-Joachim Mentzel; Jürgen R. Reichenbach (Jena University Hospital, DE)
- B37 **Automatic interactive DTI-fibre selection by the simulated electric field induced on the MRI brain surface during TMS**
Andreas Rothe (Technische Universität Berlin & Eemagine GmbH, DE)
- B38 **A robust and accurate segmentation of the knee bones from CT data**
Alex Ringenbach (Fachhochschule Nordwestschweiz, CH)

Posters **Track C**

Image Based Intervention

- C1 **Evaluation of flow parameters of a catheter for intravascular cooling**
Axel Boese; Stefanie Becker; Martin Skalej; Georg Rose (Otto von Guericke University Magdeburg, DE)
- C2 **Heating of conductive wires in an open high field MRI environment: Effect of different wire positions in the MR scanner room**
Johannes W. Krug; Kerstin Jungnickel; Jens Ricke; Frank Fischbach; Georg Rose (Otto von Guericke University Magdeburg, DE)
- C3 **A Remote Controlled Food Dispenser for Animal Research**
Olaf Christ (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- C4 **Quantification of cannula artifacts in gradient echo magnetic resonance images**
Marius Hülsmann (Westphalian University of Applied Sciences, DE); Gregor Schaefers (MR:comp GmbH, DE); Heinrich M. Overhoff (Westphalian University of Applied Sciences, DE)

Posters **Track D**

Biomaterials and Biocompatibility

- D1 **Influence of sandblasting on bond strength and static fatigue of Zeno-tec zirconia veneered with Zirox porcelain**
Christine Schille (University Hospital Tübingen & Dental Clinic, DE); Kerven Wieland; Juergen Geis-Gerstorfer (University Hospital Tübingen, DE)
- D2 **Drug release from bone implants in-vitro: An experimental setup**
Tobias Wenzel; Christian Damiani; Tanja Dreesch; Stephan Klein (Luebeck University of Applied Sciences, DE)
- D3 **Dynamic in vitro hemocompatibility testing – improving the signal to noise ratio**
Marc Müller; Benjamin Krolitzki; Birgit Glasmacher (Leibniz Universität Hannover, DE)
- D4 **Animal study for the development and validation of new tissue adhesives for the use in otorhinolaryngology**
Katja Otto (Friedrich-Schiller University Hospital, DE); Albrecht Berg; Matthias Schnabelrauch (INNOVENT e.V., DE); Gerlind Schneider (Friedrich-Schiller University Hospital, DE)
- D5 **Evaluation of bone replacement materials in a rabbit cranial defect model using micro CT and hard tissue histology**
Dirk Linde; Sandra Diebowski (Friedrich-Schiller University Hospital Jena, DE); Christoph Greiner-Petter (Ilmenau University of Technology, DE); Gerlind Schneider (Friedrich-Schiller University Hospital Jena, DE)
- D6 **Determination of human anterior lens capsule permeability for fluorescent model substances and after-cataract preventive drugs**
Christian Kastner; Marian Löbler; Thomas Reske; Katrin Sternberg (Universität Rostock, DE); Rudolf Guthoff (Universität Rostock & Universitätsaugenklinik Rostock, DE); Klaus-Peter Schmitz (Universität Rostock, DE)
- D7 **A novel method for tribological evaluation of bearing materials in total knee replacements**
Paul Goebel; Carmen Zietz; Robert Souffrant (University of Rostock, DE); Richard Bieck (Ilmenau University of Technology, DE); Daniel Kluess; Rainer Bader (University of Rostock, DE)

- D8 **Controlling Mechanical Properties of NiTi Scaffolds built by Selective Laser Melting**
Therese Bormann; Ralf Schumacher (University of Applied Sciences Northwestern Switzerland, CH); Bert Müller (University of Basel, CH); Michael de Wild (University of Applied Sciences Northwestern Switzerland, CH)
- D9 **Optimization of a test setup for examining blood damage caused by high shear forces**
Rieke Kortlepel; Benjamin Krolitzki; Birgit Glasmacher; Marc Müller (Leibniz Universität Hannover, DE)
- D10 **Drug permeation studies of hydrogels usable for stimulus-induced local drug delivery systems**
Ingo Minrath; Svea Petersen; Klaus-Peter Schmitz; Katrin Sternberg (University of Rostock, DE)

- Posters** **Track E**
- Biosensors and Bioanalytics**
- E1 **Test of a Generator in the Rumen of Cattle for Energy Harvesting to Biosensors**
Thomas Reuter; Mario Beck; Martin Hoffmann (fzmb GmbH, DE)
- E2 **Polymer-based isolation of microorganism from complex media**
Martha Schwarz (Friedrich-Schiller University, DE); Andreas Holländer (Fraunhofer-Institut für Angewandte Polymerforschung, DE); Karina Weber (Friedrich Schiller University Jena, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE)
- E3 **Bottom-up nanostructured metallic surfaces for SERS detection of low-molecular weight substances**
Martin Jahn; Sophie Zierbock; Dana Cialla; Karina Weber (Friedrich Schiller University Jena, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE)
- E4 **NIR Spectroscopy under Load - A new Method to Analyse the Functional Behaviour of Joint Cartilage**
Martin Hoffmann; Matthias Lange; Florian Meuche; Thomas Reuter (fzmb GmbH, DE); Holger Plettenberg (Arthrospec GmbH, DE); Gunter Spahn (Center of Trauma and Orthopaedic Surgery Eisenach, DE); Igor Ponomarev (fzmb GmbH, DE)
- E5 **Innovative plasmonic nanostructures as biosensor for DNA detection**
Dana Cialla; Karina Weber (Friedrich Schiller University Jena, DE); Uwe Hübner; Henrik Schneidewind; Matthias Zeisberger; Roland Mattheis; Jürgen Popp (Institute of Photonic Technology (IPHT) Jena, DE)
- E6 **High Performance Triple LED Driver with Digitally Controlled Analog Dimming for Reflection Pulse Oximetry**
Alexander Hauke; Juliane Krämer; Daniel Laqua; Sebastian Ley; Peter Husar (Ilmenau University of Technology, DE)
- E7 **Magnetic Separation to Enhance the MPI Performance of Resovist®**
Norbert Löwa; Frank Wiekhorst; Dietmar Eberbeck; Uwe Steinhoff; Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)

- E8 Improving the sensitivity of optical biosensors by means of Bloch surface waves**
Norbert Danz (Fraunhofer Institute Applied Optics and Precision Engineering (IOF), DE); Alberto Sinibaldi; Francesco Michelotti (Sapienza Universita di Roma, IT); Emiliano Descrovi (Politecnico di Torino, IT); Peter Munzert; Ulrike Schulz (Fraunhofer Institute Applied Optics and Precision Engineering (IOF), DE); Frank Sonntag (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE)
- E9 Clinical MCG at room-temperature with optical sensors**
Gertrud Lembke; Georg Bison; Markus Stumpf; Miljan Petkovic (Jena University Hospital, DE)
- E10 Generation of ready-to-use SPR chips using automated nano-spotting**
Vicky Tröger (Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS, DE); Sven Malik (TU Dresden, DE); Frank Sonntag; Stefan Schmieder (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE)
- E11 Capnography-based analysis of dead space in rats during spontaneous breathing and mechanical ventilation**
Constanze Dassow; David Schwenninger; Hanna Runck; Sarah Bühler; Josef Guttman (University Medical Center of Freiburg, DE)
- E12 Selective Stimulation of the Vagal Nerve Reduces Blood Pressure without Side Effects**
Dennis Plachta (University of Freiburg, DE); Mortimer Gierthmuehlen (University Hospital Freiburg, DE); Thomas Stieglitz (University of Freiburg, DE)
- E13 Laser based rapid prototyping for imprint technology and micro fluidics**
Niels Schilling; Tina Hoffmann; Frank Sonntag; Stefan Schmieder; Udo Klotzbach (Fraunhofer Institut für Werkstoff- und Strahltechnik IWS Dresden, DE)
- E14 A standard to measure flow rates down to 1 nl/min**
Martin Ahrens; Bodo Nestler (Luebeck University of Applied Sciences, DE)
- E15 Using the Hot Embossing Technology for the Realization of Micro-technical Structures in Medical Imaging**
Markus Detert; Stephan Friesecke; Martin Deckert; Georg Rose; Bertram Schmidt; Mandy Kaiser (Otto-von-Guericke University of Magdeburg, DE)

- E16 Material Processing with Femtosecond Laser Pulses for Medical Applications**
Steffen Fiedler; Robert Irsig (Universität Rostock, DE); Matthias Gieseke (Laser Zentrum Hannover e.V., DE); Mark Vehse; Volkmar Senz; Anna Oniszczuk; Josef Tiggesbäumker; Conrad Schuster; Anna Svanidze; Neeke Rothe (Universität Rostock, DE); Stefan Kaierle; Michael Hustedt; Heinz Haferkamp (Laser Zentrum Hannover e.V., DE); Katrin Sternberg; Klaus-Peter Schmitz; Hermann Seitz; Stefan Lochbrunner; Karl-Heinz Meiwes-Broer (Universität Rostock, DE)
- E17 Optimization of the electrical properties of SiC-improved polyimide based thin-film electrode arrays for neuroprosthetics**
Juan Ordóñez; Christian Boehler; Martin Schuettler; Thomas Stieglitz (University of Freiburg, DE)
- E18 Determining the cut-off of 1-point-vital signs detection based of a non-linear oscillating circuit (CPR|Check®)**
Stefan Fernsner (Karlsruhe Institute of Technology, DE); Torsten Birkholz; Joachim Schmidt (University Hospital Erlangen, DE); Armin Bolz (Universität Karlsruhe, DE); Marc Jaeger (Neocor GmbH, DE)
- E19 A Study of Conditioned Flexible Electrodes In Vivo and In Vitro**
Paula Klimach; Yijing Xie (University of Luebeck, DE); Thomas Stieglitz; Ulrich G. Hofmann (University of Freiburg, DE)
- E20 An experimental setup for brain activity measurement based on near infrared spectroscopy**
Damar Adhika (Institute for Signal Processing, DE); Mehrnaz Hazrati (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- E21 Simple Approaches to Fluorescence Lifetime Standards Using Dye-Quencher Pairs**
Thomas Behnke; Eva-Maria Laux; Katrin Hoffmann (BAM Federal Institute for Materials Research and Testing, DE); Sven Peters (University Hospital Jena, DE); Jens Haueisen; Matthias Klemm (Technical University Ilmenau, DE); Ute Resch (Bundesanstalt für Materialprüfung und Forschung, DE)

Posters

Track F

Biosignal Processing

- F1 **A GPU based prototyping software lock-in amplifier for optical bio-magnetometers**
Tilmann Sander-Thoemmes (Physikalisch-Technische Bundesanstalt, DE)
- F2 **Relation between neonatal behavioral states and heart rate variability**
Peter Van Leeuwen; Daniel Geue; Silke Lange; Anita Klein; Anja Franzen (Grönemeyer Institute of Microtherapy, DE); Klaus Heller (Marienhospital Witten, DE); Dietrich Grönemeyer (Grönemeyer Institute of Microtherapy, DE)
- F3 **ECG-Multichannel Frontend for Quick Stimulus Response Based on FPGA with Implemented Real-Time, Online QRS Detection Algorithm**
Paul Fritzsche; Sven Niemöller; Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)
- F4 **Influence of interior cerebrospinal fluid compartments on EEG source analysis**
Benjamin Lanfer (Institute for Biomagnetism and Biosignalanalysis & BESA GmbH, DE); Isabella Paul-Jordanov; Michael Scherg (BESA GmbH, DE); Carsten H. Wolters (University of Münster, DE)
- F5 **Circumferential Pacing Reveals Microstructure of Cardiac Tissue Preparations from Small Animals – An Approach to Classify Microfibrosis**
Robert Arnold; Thomas Wiener; Michaela Schwarz; Ernst Hofer (Medical University Graz, AT)
- F6 **Quality evaluation of a pediatric ECG database for assessment of arrhythmia detection algorithms in Automated External Defibrillators**
Patricia Radon; Uwe Steinhoff (Physikalisch-Technische Bundesanstalt, DE); Gero von Wagner; Norbert Kraft (Metrax GmbH, DE)
- F7 **Evaluation of QRS detection algorithm implemented for mobile applications based on ECG data acquired from sensorized garments**
Daniel Tantinger; Sven Feilner; Daniel Schmitz; Christian Weigand; Christian Hofmann; Matthias Struck (Fraunhofer Institute for Integrated Circuits IIS, DE)
- F8 **Feedback Control of the Electrical Stimulation induced Muscular Recruitment Determined by the Evoked Electromyogram**
Christian Klauer (Technische Universität Berlin, DE); Jörg Raisch (Technische Universität Berlin & MPI for Dynamics of Complex Technical Systems, DE); Thomas Schauer (Technische Universität Berlin, DE)

- F9 **Power Management Techniques in Wireless Sensor Networks**
Kai Becher (Fraunhofer Institute for Biomedical Engineering IBMT, DE); Sven Dussa (Karlsruhe Institute of Technology, DE); Roman Ruff; Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering IBMT, DE)
- F10 **Automatic analysis of systolic, diastolic and mean blood pressure of continuous measurement before, during and after sleep arousals in polysomnographic overnight recordings**
Dennis Lerch; Reinhold Orglmeister (TU Berlin, DE); Thomas Penzel (Charité - Universitätsmedizin Berlin, DE)
- F11 **Energy-Efficient Real-Time Compression of Biosignals**
Richard George (Hochschule für Technik und Wirtschaft des Saarlandes, DE); Josep Cardona; Roman Ruff; Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering IBMT, DE)
- F12 **ROC-testing of a spike sorting algorithm**
Christopher Doerr (Technische Hochschule Mittelhessen, DE); Dirk Hoehl; Uwe Thomas (Thomas RECORDING GmbH, DE); Thomas Schanze (Technische Hochschule Mittelhessen, DE)
- F13 **Decoding finger movements from ECoG signals using Empirical Mode Decomposition**
Mehrnaz Hazrati (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- F14 **LineLORETA: A method for linear source reconstruction based on EEG and MEG data using functional-anatomical similarity priors**
Mirco Fuchs (Leipzig University of Applied Sciences, DE); Burkhard Maess (Max Planck Institute for Human Cognitive and Brain Sciences, DE); Thomas Knösche (MPI Leipzig, DE)
- F15 **Patient Adaptive Neurofeedback for ADHD Therapy**
Tino Schmidt (Technical University Dresden, DE); Dietmar Henrich (Technical University Dresden & Lausitz University of Applied Sciences, DE)
- F16 **Human computer interface with online brute force feature selection**
Matthias Mend (University of Applied Sciences Wuerzburg-Schweinfurt & Institute of Medical Engineering, DE); Walter Kullmann (University of Applied Sciences Wuerzburg-Schweinfurt, DE)

- F17 **Synchronized measurement of peripheral physiological signals**
Daniel Matthes; Patrick Frenzel; Mirco Fuchs (Leipzig University of Applied Sciences, DE)
- F18 **Is the MS Kinect suitable for motion analysis?**
Immanuel Weber (Koblenz University of Applied Sciences, DE); Joshua Meskemper; Johannes Koch; Kim Friedl; Kai Heinrich (German Sport University Cologne, DE); Ulrich Hartmann (Koblenz University of Applied Sciences, DE)
- F19 **Food Intake Activity Detection Using an Artificial Neural Network**
Sebastian Päßler (Fraunhofer IPMS & Dresden University of Technology, DE); Wolf-Joachim Fischer (Fraunhofer IPMS, DE)
- F20 **Applanation Tonometry for Determining Arterial Stiffness**
Ying Zhao; Walter Kullmann (University of Applied Sciences Würzburg-Schweinfurt, DE)
- F21 **A Low-cost System for Recording Auditory Brainstem Responses**
Thomas Just (Ilmenau University of Technology, DE)
- F22 **A System for the Online Reconstruction of Distributed Sources from EEG and MEG data**
Mirco Fuchs (Leipzig University of Applied Sciences, DE); Thomas Knösche (MPI Leipzig, DE); Burkhard Maess (Max Planck Institute for Human Cognitive and Brain Sciences, DE)
- F23 **Fetal auditory evoked cortical responses development by fetal MEG measurements: influences on the responses latency by the gestational age, behavioral states and steroids treatment**
Uwe Schneider (Friedrich Schiller University, Jena, DE); Liviu Moraru; Daniel Wiegand (Jena University Hospital, DE); Samuel Nowack (Friedrich Schiller University, Jena, DE); Ekkehard Schleußner (Universitätsklinikum Jena, DE); Dirk Hoyer (Friedrich Schiller University, DE)
- F24 **Autonomic rhythms in the human fetus studied by short and long term correlations in fetal heart rate patterns**
Uwe Schneider; Ulrike Wallwitz; Anja Rudolph (Friedrich Schiller University, Jena, DE); Florian Tetschke; Stephan Bauer; Ekkehard Schleußner (Jena University Hospital, DE); Dirk Hoyer (Friedrich Schiller University, Jena, DE)

- Posters** **Track** **G**
- Cellular-, Tissue- und Bioengineering**
- G1 **Development of a cyclic multi-axial Strain Cell Culture Device**
Holger Lehnich; Andreas Simm; Bettina Weber; Babett Bartling (Martin-Luther-University Halle, DE)
- G2 **Cell seeding chamber for bone graft substitutes**
Jörn Hennig (University of Rostock, DE); Matthias Schieker (Ludwig Maximilians University Munich, DE); Hermann Seitz (University of Rostock, DE)
- G3 **Technology of saturation or dilution of calcium in bone and cartilage tissues in osteoporosis**
Vladyslav Vlastopulo (Biomedical Engineering, Ukraine)
- G4 **Lab-on-a-Chip based device for an optical detection of immobilized cells for food analytics**
Fabian Sauter (Hochschule Ulm & microfluidic ChipShop GmbH, DE); Richard Klemm (Fraunhofer Institut für Angewandte Optik und Feinmechanik, DE); Claudia Gärtner (microfluidic ChipShop GmbH, DE); Peter Miethel; Stephan Henze (fzmb GmbH, DE); Peter Brückner; Richard Fütterer (TU Ilmenau, DE); Holger Becker (microfluidic ChipShop GmbH, DE)
- G5 **Set-up and evaluation of an automated system for the efficient decellularization of equine carotid arteries as bioartificial vascular grafts**
Ulrike Böer; Andreas Brinkmann; Heike Jansen (Hannover Medical School, DE); Yvonne Martin (Sartorius Stedim Biotech GmbH, DE); Axel Haverich; Matthias Wilhelmi (Hannover Medical School, DE)

Posters Track **H**

Surgical Technique and Endoscopy

- H1 **RFID-based surgical instrument detection using Hidden Markov models**
Christian Meißner; Thomas Neumuth (Universität Leipzig, DE)
- H2 **Chip-on-the-Tip Endoscope with flexible Tip**
Sebastian Schlegel; Bastian Blase; Daniel Brüggemann; Florian Bühs; Robert Dreyer genannt Daweke; Martin Kelp; Heinz Lehr; Stefan Oginski (Technical University Berlin, DE)
- H3 **NIR spectroscopic analyses of chemical osteoarthritic cartilage models**
Sophie Zierbock (Friedrich-Schiller-University Jena, DE); Holger Plettenberg (Arthrospec GmbH, DE); Stephanie Liebold; Martin Hoffmann (fzmb GmbH, DE); Michael Schmitt (Friedrich-Schiller-Universität Jena, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE)
- H4 **Natural landmark tracking using triangle-based optical flow**
Sven Friedl (Fraunhofer Institute for Integrated Circuits IIS, DE); Eugen Herdt (HS Regensburg, DE); Markus Kondruweit (University Hospital Erlangen, DE); Thomas Wittenberg (Fraunhofer Institute for Integrated Circuits IIS, DE)
- H5 **Quantitative rigidity evaluation during deep brain stimulation surgery - a preliminary study**
Simone Hemm-Ode (University of Applied Sciences Northwestern Switzerland & School of Life Sciences, CH); Dagmar Gmünder; Ashesh Shah (University of Applied Sciences Northwestern Switzerland, CH); Miguel Ulla; Jean-Jacques Lemaire; Jérôme Coste (CHU Clermont-Ferrand, Hôpital Gabriel Montpied, FR)
- H6 **Correlation between laser Doppler measurements and anatomy during deep brain stimulation surgery**
Simone Hemm-Ode (University of Applied Sciences Northwestern Switzerland & School of Life Sciences, CH); Karin Wårdell (University of Linköping, SE)
- H7 **Ballistic Pain Therapy Devices: Measurement of Pressure Pulse Parameters**
Friedrich K.W. Ueberle; Abtin Jamshidi Rad (University of Applied Sciences Hamburg, DE)

- H8 **Laryngoscopic Image Stitching for View Enhancement and Documentation - First Experiences**
Maria Schuster (University Munich, DE); Tobias Bergen; Christian Münzenmayer (Fraunhofer IIS, DE); Maximilian Reiter (University Munich, DE); Sven Friedl; Thomas Wittenberg (Fraunhofer IIS, DE)

Posters Track **I**

Clinical Engineering

- I1 **Can ferromagnetic metal detectors improve MRI safety?**
Andreas Heinrich; Felix Güttler; Urte Jäger; Ulf Teichgräber (University Hospital Jena, DE)
- I2 **MR-Compatible Servo Drive - First Results**
Peter Pott; Andreas Hiemstra; Helmut F. Schlaak (Technische Universität Darmstadt, DE)
- I3 **Left atrial and left ventricular conduction delay by transesophageal electrocardiography with hemispherical electrodes in sinus rhythm cardiac resynchronization therapy**
Matthias Heinke (University of Jena, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE); Helmut Kuehnert (University of Jena, DE); Tobias Heinke (Siemens AG Healthcare Sector, Rudolstadt, DE); Ralf Surber; Dirk Prochnau; Hans Reiner Figulla (University of Jena, DE)

Posters Track **J**

Ergonomics and Risk Management

- J1 **Risk Management: Integration of a passive UHF-RFID system in medical environment**
Ziad Mabrouk (Münster University of Applied Sciences & Münster University, DE); Yue Ying; Uvo M. Hölscher (Münster University of Applied Sciences, DE)
- J2 **Acoustic noise control during auditory fMRI using a DSP system - first initial in vivo results**
Daniel Güllmar; Markus Hädrich; Jürgen R. Reichenbach (Jena University Hospital, DE)

Posters

Track **K**

Home health care and AAL

- K1 Time Synchronization Protocol in Wireless Sensor Networks**
Kai Becher; Roman Ruff; Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering IBMT, DE)

Posters

Track **L**

Clinical and Ambulatory Monitoring

- L1 Development of a wearable and wireless, modular, multichannel, EEG-System utilising dry-electrodes for long time monitoring**
Unmesh Ghoshdastider; Christian Lange; Reinhard Viga (University of Duisburg-Essen, DE); Anton Grabmaier (Fraunhofer IMS, DE)
- L2 Illusory Hand Ownership Induced by an MRI Compatible Immersive Virtual Reality Device**
Felix Bach; Hueseyin Kemal Çakmak; Heiko Maaß (Karlsruhe Institute of Technology, DE); Robin Bekrater-Bodmann; Jens Foell; Martin Diers; Jörg Trojan; Xaver Fuchs; Herta Flor (Central Institute of Mental Health, DE)
- L3 Web Service-based presentation of vital signs on mobile devices**
Carola V. Nitz (Universität zu Lübeck, DE); Stefan Schlichting (Drägerwerk AG & Co. KGaA, DE); Stephan Pöhlsen (Dräger Medical GmbH, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- L4 Multi-radio wireless sensor node for mobile biomedical monitoring**
Krzysztof Piotrowski; Steffen Ortmann; Peter Langendoerfer (IHP GmbH, DE)
- L5 Microfluidic device for fast on-site biomedical diagnostic on the example of lithium analysis in blood**
René Sewart; Claudia Gärtner (Microfluidic ChipShop GmbH, DE); Richard Klemm (Fraunhofer Institut für Angewandte Optik und Feinmechanik, DE); Sebastian Schattschneider; Holger Becker (Microfluidic ChipShop GmbH, DE)

- L6 Quantification of nasal respiratory flow by tracheal sound analysis**
Keywan Ali Sohrabi (ThoraTech GmbH, DE); Denise Basu (Philipps-University Marburg, DE); Florian Schudt; Michael Scholtes; Oskar Seifert (Technische Hochschule Mittelhessen, DE); Ulrich Koehler (Philipps-Universität Marburg, DE); Volker Gross (Technische Hochschule Mittelhessen, DE)
- L7 Accelerometer Sensor System for Continuous Determination of Systolic Time Intervals**
Sergey Ershov; Olaf Skerl (Biotronik SE & Co. KG, DE); Jan Fischer (TU Ilmenau, DE); Michael Lippert; Albrecht Urbaszek (Biotronik SE & Co. KG, DE)
- L8 Intraoperative Tremor Monitoring Using Smartphones**
Igor Fischer (University of Duesseldorf, DE)
- L9 Individual thorax geometry improves EIT image reconstruction**
Zhanqi Zhao (Furtwangen University, DE); Sven Pulletz; Inéz Frerichs (University Medical Center Schleswig-Holstein, DE); Knut Moeller (Furtwangen University, DE)
- L10 Automatic segmentation of collapsed lung regions in thorax CT**
Laurentiu Mirica (Furtwangen University, DE); Sven Pulletz; Inéz Frerichs (University Medical Center Schleswig-Holstein, DE); Vimal Manihani; Zhanqi Zhao; Knut Moeller (Furtwangen University, DE)
- L11 Hemodynamic Monitoring with an Implantable Pressure Monitor is Improved by Additional Detection of Heart Sounds**
Albrecht Urbaszek; Jens Kirchner; André van Ooyen; Olaf Skerl (Biotronik SE & Co. KG, DE)

Posters

Track **M**

Magnetic Methods in Medicine

- M1 The effect of biometric and cardiovascular parameters on the orientation of cardiac magnetic field maps**
Peter Van Leeuwen (Grönemeyer Institute of Microtherapy, DE); Gregor Eiling (Philippusstift, Essen, DE); Rifat Konuralp (Grönemeyer Institute of Microtherapy, DE); Birgit Hailer (Philippusstift, DE); Dietrich Grönemeyer (Grönemeyer Institute of Microtherapy, DE)
- M2 Spatial reconstruction of a magnetic nanoparticle distribution using a single sensor and multiple magnetizing coils**
Maik Liebl; Uwe Steinhoff; Frank Wiekhorst; Kay Schwarz; Peter Zirpel; Dirk Gutkelch; Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE); Jens Hauelsen (Technical University Ilmenau, DE)
- M3 A microfluidic chip for size dependent fractionation of magnetic microspheres for magnetic drug targeting**
Silvio Dutz (IPHT Jena, DE); Michael Hayden (Simon Fraser University, CA); Allison Schaap; Boris Stoeber; Urs Häfeli (University of British Columbia, CA)
- M4 Neurovascular intervention with an electromagnetic navigated guidewire**
Tomasz Bien; Andreas Brose; Bertram Schmidt; Georg Rose (Otto von Guericke University Magdeburg, DE)
- M5 Investigation of magnetic nanoparticles incorporated within textile hernia implants**
Ioana Slabu; Gernot Güntherodt; Thomas Schmitz-Rode; Nils Krämer; Hank Donker; Jens Otto; Christiane Kuhl; Uwe Klinge; Martin Baumann (RWTH Aachen University, DE)
- M6 Principal moments of a multipole expansion to quantify the magnetic nanoparticle distributions in arteries**
Frank Wiekhorst; Wolfgang Haberkorn; Uwe Steinhoff (Physikalisch-Technische Bundesanstalt, DE); Stefan Lyer; Christoph Alexiou (University Hospital Erlangen, DE); Markus Baer; Lutz Trahms (Physikalisch-Technische Bundesanstalt, DE)
- M7 Extended Field of View in Magnetic Particle Imaging**
Florian Griese; Mandy Grüttner; Thorsten M. Buzug (University of Luebeck, DE)

16:30 - 17:00 Coffee break - Trade Exhibition

- M8 Imaging of magnetic nanoparticles by atomic magnetometers**
Victor Lebedev; Natascia Castagna; Antoine Weis; Benjamin Michen; Alke Fink (University of Fribourg, CH); Georg Bison (Jena University Hospital, DE)
- M9 Improved reproducibility of dynamic 31P-MRS in the calf muscle during exercise by self-adjusted muscle activity**
Alexander Gussev; Patrick Hiepe; Reinhard Rzanny; Jürgen R. Reichenbach (Jena University Hospital, DE)

Posters

Track **N**

Medical Information Systems, Telemedicine, eHealth, mHealth

- N1 Measuring Affect Using a Standard Mouse Device**
Kristina Schaaff; Raphael Degen; Nico Adler (FZI Forschungszentrum Informatik, DE); Marc Adam (Karlsruhe Institute of Technology (KIT), DE)
- N2 Technical Assistance Systems Influence the Work Organisation to Challenge the Demographical Change**
Horst Meier; Björn Krückhans (Ruhr-Universität Bochum, DE)
- N3 Intelligent Capacitive Sensor Array for Removal Detection from Various Surfaces of Tagged Equipment in Hospitals**
Julia Loeschel; Daniel Laqua; Peter Husar (Ilmenau University of Technology, DE)
- N4 Prediction of surgical work steps in neurosurgery**
Philipp Liebmann; Thomas Neumuth (Universität Leipzig, DE)
- N5 Connecting workflow management to the OR network: Design and evaluation of a bridge to enable dynamic systems behaviour**
Stefan Franke; Philipp Liebmann; Thomas Neumuth (Universität Leipzig, DE)
- N6 Technically Assisted Analysis of Large Quantities of Numerical Data in Preclinical Tumor Research**
Daniel Pollig; Catherine Disselhorst-Klug (RWTH Aachen University, DE)
- N7 The ELN-Survey: On the potential of laboratory IT systems to support the biomedical research process**
Frederik Klöckner; Thomas Schmitz-Rode; Robert Farkas (RWTH Aachen University, DE)

16:30 - 17:00 Coffee break - Trade Exhibition

- N8 **Service Oriented Architecture Based Web Application Model for Collaborative Biomedical Signal Analysis**
Mufti Mahmud; Mohammed Mostafizur Rahman (University of Padova, IT); Davide Travalin (St. Jude Medical Italia SPA, IT); Pawel Raif (ATH, University of Bielsko-Biala, PL); Amir Hussain (University of Stirling, UK)
- N9 **Routine Mobile Applications for Emergency Medical Services in Mass Casualty Incidents**
Tilo Mentler; Michael Herczeg (University of Luebeck, DE); Martin Christof Kinds Müller (Universität Hamburg, DE); Timo Rumland (DIGITALYS GmbH, DE); Sophie Jent; Mathias Stoislw (University of Luebeck, DE)

Posters

Track **O**

Modelling and Simulation

- O1 **Impact of Antiarrhythmic Drugs on a Virtual Model of Atrial Fibrillation**
Mathias Wilhelms; Lukas Holl; Olaf Doessel; Gunnar Seemann (Karlsruhe Institute of Technology (KIT), DE)
- O2 **Flow regulation in multi branched models of blood vessels**
Moritz Ringelstein (TU Berlin & Charité - Universitätsmedizin Berlin, DE); Andre Berthe; Torsten Schneider; Ulrich Kertzscher; Klaus Affeld (Charité - Universitätsmedizin Berlin, DE)
- O3 **Implementation of Dynamic Plotting for a Ventilation Simulator on Android Mobile Devices**
Thomas Lehmann; Thu Nguyen; Knut Moeller (Furtwangen University, DE)
- O4 **Biomechanical Modelling of Three-Dimensional Scaffold-Free Cartilage Constructs – A Comparison between Experiment and Simulation**
Thomas Reuter; Matthias Lange; Igor Ponomarev; Florian Meuche; Sven Wietstock; Martin Hoffmann (fzmb GmbH, DE)
- O5 **Sensitivity of EEG leads to volume conductor properties**
Sven Wagner; Johannes Vorwerk; Lars Ruthotto; Harald Kugel; Martin Burger (University of Münster, DE); Thomas Knösche; Burkhard Maess (MPI Leipzig, DE); Carsten H. Wolters (University of Münster, DE)

- O6 **Validation and Application of Realistic Head Modelling to MEG**
Johannes Vorwerk (University of Münster, DE); Benjamin Lanfer (University of Münster & BESA GmbH, DE); Florian Grüne; Carsten H. Wolters (University of Münster, DE)
- O7 **Comparison of Boundary Element and Finite Element Approaches to the EEG Forward Problem**
Johannes Vorwerk (University of Münster, DE); Maureen Clerc (Ecole Nationale des Ponts et Chaussées, FR); Martin Burger; Carsten H. Wolters (University of Münster, DE)
- O8 **Enhancements of a mechanical lung simulator for ex vivo measuring of aerosol deposition in lungs**
Theresa Steiner; Mathias Forjan; Tamara Kopp (UAS Technikum Wien, AT); Zbynek Bureš (College of Polytechnics Jihlava, CZ); Andreas Drauschke (UAS Technikum Wien, AT)
- O9 **Development of a Phantom to Modulate the Maternal and Fetal Pulse Curve for Pulse Oximetry Measurements**
Steven Weyrich; Sina Sprenger; Marcel Böttrich; Philipp Schmidt; Daniel Laqua; Sebastian Ley; Peter Husar (Ilmenau University of Technology, DE)
- O10 **Transmission Line Model for Pulse Wave Analysis Accompanied on Experimental Measurements at a Human Model**
Eberhard Engelen (University of Duisburg-Essen, DE)
- O11 **A GPU-accelerated Performance Optimized RAP-MUSIC Algorithm for Real-Time Source Localization**
Christoph Dinh (Ilmenau University of Technology & Jena University Hospital, DE); Johannes Rühle (Ilmenau University of Technology, DE); Steffen Bollmann (Kinderspital Zürich, CH); Jens Hauelsen (Ilmenau University of Technology, DE); Daniel Güllmar (Jena University Hospital, DE)
- O12 **Development of a testing method for the determination of interfacial micromotions of short-stemmed hip endoprosthesis**
Robert Souffrant; Rebecca Schubert (University Rostock, DE); Wolfram Steens (Orthopädisch-Neurochirurgischen Zentrum, DE); Alexander Katzer (Orthoclinic Hamburg, DE); Wolfram Mittelmeier; Rainer Bader (University Rostock, DE)

- O13 **Modelling the Progression of Brain Metastases**
Stefan Becker; Andreas Mang; Alina Toma; Tina Anne Schütz; Thorsten M. Buzug (Universität zu Lübeck, DE)
- O14 **Brain Atlas based Region of Interest Selection for Real-Time Source Localization using K-Means Lead Field Clustering and RAP-MUSIC**
Christoph Dinh (Ilmenau University of Technology & Jena University Hospital, DE); Daniel Strohmeier; Jens Haueisen (Ilmenau University of Technology, DE); Daniel Güllmar (Jena University Hospital, DE)
- O15 **Simulating extracellular microelectrode recordings on cardiac tissue preparations in a bidomain model**
Matthias W. Keller; Gunnar Seemann; Olaf Doessel (Karlsruhe Institute of Technology (KIT), DE)
- O16 **Simulation system for puncture of the Vena jugularis sinistra in horses**
Gerold Bausch (Leipzig University of Applied Sciences, DE); Uta Delling (University of Leipzig, DE); Antje Schlenker (Leipzig University of Applied Sciences, DE); Jane-Carolin Eichel (University of Leipzig, DE); Werner Korb (Leipzig University of Applied Sciences, DE)
- O17 **Adaptive control system for volume-controlled ventilation in small animals**
Robert Huhle (Technische Universität Dresden, DE); Spieth Peter (University Hospital Dresden, DE); Thea Koch (Technische Universität Dresden, DE); Marcelo Gama de Abreu (University Hospital Dresden, DE)
- O18 **Neuromuscular Junction Transmission is Effected by Quantum Entanglement of Ion Transition States**
Mohammed Mostafizur Rahman; Mufti Mahmud (University of Padova, IT)
- O19 **Pressure Pulse Fields: Comparison of optical hydrophone measurements with FEM Simulations**
Abtin Jamshidi Rad; Friedrich K.W. Ueberle (University of Applied Sciences, Hamburg, DE)
- O20 **A curve-shaped flexible mesh cage for treatment of large segmental bone defects - a finite element analysis**
Jan Wieding; Robert Souffrant; Wolfram Mittelmeier; Rainer Bader (University of Rostock, DE)
- O21 **Mechanical properties of the patient circuit and its analogous model**
Martin Rožánek (Czech Technical University in Prague, CZ)

- Posters** **Track** **P**
- Ophthalmology Techniques, Optical and Photonic Processes**
- P1 **Reduction of periodic noise in Fourier domain optical coherence tomography images by frequency domain filtering**
Yijing Xie; Lei Chen (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- P2 **Pulsed wavelength-dependent laser stimulation of the inner ear**
Michael Schultz (Medical University of Hannover & Laser Zentrum Hannover, DE); Peter Baumhoff; Ingo Teudt; Hannes Maier (Medical University of Hannover, DE); Alexander Krüger (Laser Zentrum Hannover e.V., DE); Thomas Lenarz; Andrej Kral (Medical University of Hannover, DE)
- P3 **Evaluation of a novel method to measure the intra-ocular pressure based on a mechanical eye model**
Kutaiba Saleh; Volkmar Unger; Alexander Dietzel (Ilmenau University of Technology, DE); Detlef Heydenreich (Elektronik & Präzisionsbau Saalfeld GmbH, DE); Rico Großjohann; Clemens Jürgens; Frank Tost (Universitäts-Augenklinik Greifswald, DE); Jens Haueisen (Ilmenau University of Technology, DE)
- P4 **Comparative Investigation in Stray Light Measurement in the Human Eye**
Stefan Schramm; Bernd-Ulrich Seifert; Jens Haueisen (Technical University Ilmenau, DE); Patrick Schikowski; Jürgen Prehl; André Kaeding (GMC Systems mbH, DE); Kathleen S. Kunert (HELIOS Klinikum Erfurt, DE)
- Posters** **Track** **Q**
- Personalized Medical Technology**
- Q1 **Nasal long-term inhalation facilitates enhanced thoracic particle deposition**
Keywan Ali Sohrabi (ThoraTech GmbH, DE); Abass Sohrabi; Damiano Librizzi (Philipps-University Marburg, DE); Ljudmila Mursina (Fachhochschule Giessen-Friedberg, DE); Ulrich Koehler (Philipps-University Marburg, DE); Volker Gross (Technische Hochschule Mittelhessen, DE)
- Q2 **Characterization of interventricular desynchronization in heart failure patients**
Kirsten Rotter; Katharina Kroll; Christoph Nienaber (University of Rostock, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE)

Posters Track R

Prevention and Rehabilitation Engineering

- R1 **A passive robotic device for VR-augmented upper limb rehabilitation in stroke patients**
Martin Steinisch; Maria Gabriella Tana; Silvia Comani (University "G. d'Annunzio", Chieti, IT)
- R2 **Detection of localized overload during the bedding of patient as an alarm system for decubitus prophylaxes**
Stephan Böhringer; Christoph Suter; Matthias Jeker; David Hradetzky (University of Applied Sciences Northwestern Switzerland, CH)
- R3 **The rubber hand illusion: Maintaining factors and a new perspective in biomedical engineering of lower limb prosthetics?**
Oliver Christ; Philipp Beckerle; Julia Preller; Mario Jokisch; Stephan Rinderknecht; Janis Wojtus; Oskar von Stryk; Joachim Vogt (Technische Universität Darmstadt, DE)
- R4 **Instrumented Arthrometry of the anterior cruciate ligament A comparison**
Anja Krautter; Laura Rohnstock; Knut Moeller; Zhanqi Zhao (Furtwangen University, DE); Gernot Felmet (Artico Sportklinik, DE)
- R5 **Development of procedures in Rapid Manufacturing to improve individual therapy in Rehabilitation**
Jörg Subke; Judith Schmale; Hartmut Bode (THM University of Applied Sciences, DE)
- R6 **Novel approach for estimating muscular activity using mechanical effects of the human thigh as an alternative to EMG**
Juergen Hielscher; Thorsten Meiss; Roland Werthschützky (Technische Universität Darmstadt, DE)
- R7 **Collection and evaluation of physical performance of grade 5 to 12 high school students with anthropometric data and hand strength data**
Constanze Weber; Hansjörg Weber (Technische Universität Dresden, DE)

Posters Track S

Prosthetics and Implants

- S1 **Development platform for intelligent implants in real-time monitoring applications**
Josep Cardona (Fraunhofer Institute for Biomedical Engineering, DE); Jana Kiesel; Franziska Rönsch (University of Technology Ilmenau, DE); Carsten Müller; Roman Ruff; Klaus-Peter Hoffmann (Fraunhofer Institute for Biomedical Engineering, DE)
- S2 **Molecular Sieves as Getter Material for Active Implantable Medical Devices**
Fabian Kohler; Yannick Porro; Thomas Stieglitz; Martin Schuettler (University of Freiburg, DE)
- S3 **The influence of annealing on the electrical stability of Parylene C structures**
Rene P. von Metzzen; Thomas Stieglitz (University of Freiburg, DE)
- S4 **Flow Sensor for the Velocity Measurement at a Pulsed Volume Flow**
Eberhard Engelen (University of Duisburg-Essen, DE)
- S5 **New test system to assess the risk of electromagnetic interference in cardiac active implantable medical devices**
Dominik Stunder; Christian Kaiser; Jiri Silny; Stephan Joosten (RWTH Aachen University, DE)
- S6 **An implantation technique for polyimide based flexible array probes facilitating neuronavigation and chronic implantation**
Susanne Löffler; Yijing Xie (University of Luebeck, DE); Peter Detemple (Institut für Mikrotechnik Mainz GmbH, DE); Andreas Moser (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- S7 **Connecting and Encapsulation Technology for Active Middle Ear Implants**
Kia Tavakoli (NMI, DE); Dominik Kaltenbacher (Fraunhofer IPA, DE); Mark Winter (Auric, DE); Hans-Peter Zenner (Universitätsklinikum Tübingen & HNO-Klinik, DE); Claus Burkhardt (NMI, DE)

- S8 **Investigation of the use of Solderjet Bumping for joining the thin-walled glass package of a complex mechatronic lens implant**
Liane Rheinschmitt (Karlsruhe Institute of Technology, DE); Thomas Burkhardt (Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF & Friedrich-Schiller University Jena, DE); Jörg Nagel (Karlsruhe Institute of Technology, DE); Erik Beckert (Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF, DE); Ulrich Gengenbach; Georg Bretthauer (Karlsruhe Institute of Technology, DE)
- S9 **Spray-coating process development, manufacture, quality assessment and drug release behavior of peripheral drug-eluting stents**
Niels Grabow; Lena Schmitt; Sylvia Pfensig; Thomas Reske; Henrik Rehme; Volkmar Senz; Katrin Sternberg; Klaus-Peter Schmitz (Universität Rostock, DE)
- S10 **A wireless integrated hip prosthesis loosening detection system - influence of mechanical cross-sensitivities on resonance frequencies**
Sebastian Sauer; Uwe Marschner (Technical University of Dresden, DE); Birger Jettkant (Berufsgenossenschaftliches Universitätsklinikum Bergmannsheil GmbH, DE); Wolf-Joachim Fischer (Technical University of Dresden, DE)
- S11 **Experimental electrical field distribution measurements in a perfused ex vivo model**
Pascal Martini (University of Applied Sciences Trier, DE); Marta Cercone; Jon Cheetham (Cornell University, USA); Klaus Peter Koch (University of Applied Sciences Trier, DE)
- S12 **Thinned CMOS Pressure Sensors for Tactile Sensing in Prosthetics**
Joachim Häfner (RWTH Aachen University, DE); Wolfgang Betz; Michael Görtz (Fraunhofer IMS, DE); Wilfried Mokwa (RWTH Aachen University, DE)
- S13 **Development of an Extraosseous Nitinol Implant for the Hallux Valgus Treatment: Preliminary Mechanical Investigations, Design and Numerical Simulation**
Verena Heizmann (University of Applied Science, DE); Felix Capanni; Thomas Engleder (Ulm University of Applied Sciences, DE); Andreas Appelt (Orthopädische Praxisklinik Neu-Ulm und Weißenhorn, DE)

- S14 **New features and functions in implants through additive manufacturing technology and active materials**
Christian Rotsch; Bernhard Müller; Thomas Töppel; Andrea Böhm; Jan Bräunig; Welf-Guntram Drossel (Fraunhofer Institute for Machine Tools and Forming Technology, DE)
- S15 **Histological findings in articular cartilage grafts after laser exposition for tissue soldering**
Philipp Hoffmann; Thomas Reuter (fzmb GmbH, DE); Sebastian Sauerbier (Intros GmbH, DE); Martin Hoffmann; Carmen C. Klein (fzmb GmbH, DE)
- S16 **The effect of different guide wires on the trackability of coronary stent delivery systems**
Christoph Brandt; Wolfram Schmidt; Peter Behrens; Klaus-Peter Schmitz (University of Rostock, DE)
- S17 **Suitability of porcine pericardial tissue for heart valve engineering: Biomechanical properties**
Daniela Arbeiter; Niels Grabow; Yvonne Wessarges; Katrin Sternberg; Klaus-Peter Schmitz (University of Rostock, DE)
- S18 **Development of a Patient-Specific Carbon-Prosthesis to Support Sporting Activities**
Melanie Dürr; Carina Kraus; Christian Peschmann; Felix Capanni; Thomas Engleder (University of Applied Sciences Ulm, DE)
- S19 **Preliminary design of a tendon-based anthropomorphic robotic hand**
Stephen Oung; Bernd Matthias Pohl (University of Luebeck, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- S20 **MRI and MRS investigation of patients with artificial hip joints at 3 T**
Reinhard Rzanny; Klaus Sander; Patrick Hiepe; Alexander Gussew; Andreas Roth; Raimund Kinne; Jürgen R. Reichenbach (Jena University Hospital, DE)
- S21 **Ex vivo-investigations of the MR compatibility of temporary pace-maker leads on pig hearts at 1.5 and 3.0 T**
Reinhard Rzanny; Andreas Hansch; Alexander Pfeil; Stefanie Drobnik; Alexander Gussew; Jürgen R. Reichenbach (Jena University Hospital, DE)

- S22 **Simulation study of artifacts in Computed Tomography caused by metal implants**
Gregor Imboden; Erik Schkommodau (University of Applied Sciences Northwestern Switzerland, CH)
- S23 **Wireless Power Transmission for Powering Medical Implants Situated in an Abdominal Aortic Aneurysm**
Bryce Bradford; Wolfgang Krautschneider; Dietmar Schroeder (Hamburg University of Technology, DE)
- S24 **Development of a novel valved drug-eluting glaucoma implant for safe and durable reduction of intraocular pressure**
Stefan Siewert; Anne Roock; Wolfram Schmidt; Marian Löbler (Universität Rostock, DE); Ulf Hinze; Boris Chichkov (Laser Zentrum Hannover e.V., DE); Rudolf Guthoff (Universität Rostock & Universitätsaugenklinik Rostock, DE); Katrin Sternberg; Klaus-Peter Schmitz (Universität Rostock, DE)
- S25 **Material processing with shaped femtosecond laser pulses**
Conrad Schuster; Neeke Rothe; Anna Svanidze; Steffen Fiedler; Robert Irsig; Josef Tiggesbäumker; Volkmar Senz; Mark Vehse; Hermann Seitz; Stefan Lochbrunner (Universität Rostock, DE)

Room: HS1 [Presentations in English] **Track C**

Image Based Intervention

Chairs: Andreas Melzer (University of Dundee, UK); Thomas Schmitz-Rode (RWTH Aachen University, DE)

- 17:00 **Navigated targeting of liver lesions: pitfalls of electromagnetic tracking**
Alfred Michael Franz (German Cancer Research Center, DE); Mark Servatius (University of Heidelberg, DE); Alexander Seitel (German Cancer Research Center, DE); Boris Radeleff (University of Heidelberg, DE); Dr. Hans-Ulrich Kauczor; Hans-Peter Meinzer; Lena Maier-Hein (German Cancer Research Center, DE)
- 17:15 **Transfer of methods from radiotherapy planning to ablation planning with focus on uncertainties and robustness**
Markus Stoll; Thomas Boettger; Carsten Schulze; Mark Hastenteufel (Siemens AG, DE)
- 17:30 **Maximum instrument length for MR-guided minimal-invasive interventions of the lumbar spine in open high-field MRI**
Andreas Heinrich; Felix Güttler (University Hospital Jena, DE); Maximilian De Bucoart (Charité - Universitätsmedizin Berlin, DE); Ulf Teichgräber (University Hospital Jena, DE)
- 17:45 **Respiratory Motion Compensation in Image-Guided Therapies**
Jorge Gooding; Sylvie von Werder; Andreas H. Mahnken; Catherine Disselhorst-Klug (RWTH Aachen University, DE)
- 18:00 **Active Integrated Tracking Detectors for MRI-Guided Interventions**
Jens Anders; Maurits Ortmanns (University of Ulm, DE); Klaus Scheffler (Max-Planck-Institut Tübingen, DE); Giovanni Boero (Ecole Polytechnique Federale de Lausanne, DE)
- 18:15 **Technology Roadmap for Integration of Resonant Markers in MRI Compatible Instruments**
Mandy Kaiser; Axel Boese; Andreas Brose; Martin Deckert; Georg Rose; Bertram Schmidt; Uta Wonneberger; Frank Fischbach; Jens Ricke; Markus Detert (Otto-von-Guericke University Magdeburg, DE)

Room: **HS2** [Presentations in English] **Track S**

FS: Cardiovascular Implants (Medizintechnik am Beispiel der artifiziellen Herzklappen)

Chair: Hans Reiner Figulla (Friedrich Schiller University Jena, DE)

- 17:00 **Flussdynamik von artifiziellen Herzklappen**
Torsten Doenst (Jena University Hospital, DE)
- 17:15 **Heart Valve Tissue Engineering – die biomechanische Zukunft artifizieller Herzklappen?**
Payam Akhyari (Universitätsklinikum Düsseldorf, DE)
- 17:30 **Evolution of catheter-guided valve replacement**
Markus Ferrari (Friedrich Schiller University Jena, DE)
- 17:45 **Current Status und Future Perspective of Interventional Treatment of Valvular Heart Disease**
Alexander Lauten (Klinik für Innere Medizin Jena, DE)

Room: **HS3** [Presentations in German] **Track D**

Biomaterials and Biocompatibility

Chair: Thomas Lenarz (Medizinische Hochschule Hannover, DE)

- 17:00 **Effect of CCN1 coating of decellularized equine carotid arteries on local biocompatibility and humoral immunogenicity in a heterogenous animal model**
Ulrike Böer; Stefanie Lützner; Danny Jonigk; Melanie Klingenberg; Axel Haverich; Matthias Wilhelmi (Hannover Medical School, DE)
- 17:15 **TiO₂ nanotube micropatterns – highly selective model surfaces**
Andreas Pittrof (Friedrich Alexander University of Erlangen-Nuremberg, DE)
- 17:30 **Biocompatibility of biodegradable polymeric stents in an interventional porcine carotid artery model**
Sabine Kischkel; Niels Grabow; Method Kabelitz; Benjamin Erdle; Wolfgang Schareck (University of Rostock, DE); David Martin; Simon Williams (Tepha, Inc., USA); Katrin Sternberg; Klaus-Peter Schmitz; Carsten Bünger (University of Rostock, DE)
- 17:45 **Microelectromechanical Implants: Encapsulation Concepts and Test Procedures**
Wolfgang Betz (Fraunhofer IMS, DE); Hoc Khiem Trieu (TU Hamburg-Harburg, DE); Holger Vogt (Fraunhofer IMS, DE)
- 18:00 **Hyperhydrophilic Surfaces, the Inverse Lotus Effect and Imaginary Contact Angles**
Herbert Jennissen (Universität Duisburg-Essen, DE); Steffen Lüers; Markus Laub (MorphoPlant GmbH, DE)

19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)

20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)

19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)

20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)

Room: **HS4** [Presentations in German] **Track Z****VDE MedTech Tutorial**

Chair: Cord Schlötterburg (VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V. & DGBMT Deutsche Gesellschaft für Biomedizinische Technik im VDE, DE)

- 17:00 **Biomedical Engineering in Germany: Competence, Technology Transfer, Financing**
Cord Schlötterburg (VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V. & DGBMT Deutsche Gesellschaft für Biomedizinische Technik im VDE, DE)
- 17:20 **News of Standardization: Alarms and Useability**
Klaus Neuder (VDE DKE, DE)
- 17:40 **Blues Hospital: Efficient, Quality Optimized and Energy Efficient Processes in the Hospital**
Johannes Dehm (VDE Verband der Elektrotechnik Elektronik Informationstechnik e. V., DE)
- 18:00 **Certification of Processes: Sustainability and Software**
Michael Bothe (VDE Prüf- und Zertifizierungsinstitut, DE)
- 18:20 **Discussion**

Room: **HS5** [Presentations in English] **Track E****Biosensors and Bioanalytics (3)**

Chairs: Gerald Urban (Albert-Ludwigs-Universität Freiburg, DE)

- 17:00 **Low-cost electrochemical multisensor card for medical applications comprising a novel stable solid-state reference electrode**
Tobias Ensslen; Gorden Link; Maik Hoffmann; Jasmin Haap; Martin Stelzle; Massimo Kubon (University of Tübingen, DE)
- 17:15 **Development of a novel two-channel microfluidic system for biomedical application in cancer research**
Taleih Rajabi (Karlsruhe Institute of Technology, DE); Volker Huck (Heidelberg University, DE); Ralf Ahrens (Karlsruhe Institute of Technology, DE); Marie Christin Apfel (Heidelberg University, DE); Seoung-Eun Kim (Karlsruhe Institute of Technology, DE); Stefan Schneider (Heidelberg University, DE); Andreas Guber (Karlsruhe Institute of Technology, DE)
- 17:30 **Membrane based sample preparation chip**
Andreas Morschhauser (Fraunhofer Institute for Electronic Nano Systems, DE); Cornelia Stiehl (Biflow Systems GmbH, DE); Allyn Große (Fraunhofer Institute for Electronic Nano Systems, DE); Jörg Nestler (Biflow Systems GmbH, DE); Thomas Otto (Fraunhofer Institute for Electronic Nano Systems, DE); Thomas Geßner (Fraunhofer Institute for Electronic Nano Systems, DE)
- 17:45 **Segmented flow microfluidics in multilumen tubing**
Mike Stubenrauch; Robert Fischer; Heide Creutzburg; Caecilie von Teichman; G. Alexander Groß; Hartmut Witte (Ilmenau University of Technology, DE)
- 18:00 **Automated Micro-PIV measurement in Lab-on-a-Chip systems**
Mathias Busek; Christoph Polk; Thomas Albrecht (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE); Uwe Marx (TissUse GmbH, DE); Jörg König (TU Dresden, DE); Frank Sonntag (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE)

19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)

Room: **HS7** [Presentations in English] **Track K**

Home Health care and AAL

Chairs: Michael Imhoff (Ruhr-University Bochum, DE)
Jens Muehlsteff (Philips Research, NL)

- 17:00 **Monocular Head-Mounted SSVEP based Brain-Computer Interface to Retain Situational Awareness**
Tobias Oesterlein (Karlsruher Institut für Technologie, DE); Reinhold Scherer; Gernot Müller-Putz (Graz University of Technology, AT)
- 17:15 **Sensor System for an active Orthosis supporting the Elderly**
Carlos Minamisava; Juergen Hielscher; Thorsten Meiss; Roland Werthschützky (Technische Universität Darmstadt, DE)
- 17:30 **Supporting Dementia Patients at Home: The MeMoTray**
Tobias Limbach (User Interface Design GmbH, DE)
- 17:45 **Comparison of two methods to assess transdiaphragmatic pressure at different levels of work of breathing**
Kristel Lopez-Navas (University of Applied Sciences Lübeck, DE); Sebastian Brandt (University of Lübeck & University Medical Center Schleswig-Holstein, DE); Merle Strutz (University of Applied Sciences Lübeck, DE); Hartmut Gehring (University of Lübeck & University Medical Center Schleswig-Holstein, DE); Ullrich Wenkebach (University of Applied Sciences Lübeck, DE)
- 18:00 **New applications of phonocardiography for the home-monitoring of cardiac patients**
Andreas Brensing (Hochschule RheinMain, DE)

19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)

20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)

Room: **HS8** [Presentations in German] **Track J**

Ergonomics and Risk Management

Chairs: Uvo M. Hölscher (Münster University of Applied Sciences, DE); Werner Korb (Leipzig University of Applied Sciences, DE)

- 17:00 **Standardized research on ergonomics, usability and workflow analysis using high fidelity simulation labs**
Eric Stricker (University Hospital Tübingen & Center for Patientsafety and Simulation, DE); Stefan Pfeffer (University of Stuttgart, DE); Michael Trick (Klinikum Konstanz, DE); Marcus Rall (University Hospital Tübingen, DE); Thomas Maier (University of Stuttgart, DE)
- 17:15 **Taxonomies of errors can act as a tool to increase patient safety**
Michael Lindenthal (University of Applied Sciences Münster, DE)
- 17:30 **Cognitive Ergonomics and Informatory Load in Anesthesia**
Stefan Pfeffer; Thomas Maier (University of Stuttgart, DE); Eric Stricker; Marcus Rall (University Hospital Tübingen, DE); Michael Trick (Klinikum Konstanz, DE)
- 17:45 **Ergonomic Problems Originating in the Use of High-Frequency and Ultrasonic Medical Devices**
Anna-Maria Seyffert; Sylvia Donner; Marc Kraft (Technische Universität Berlin, DE)
- 18:00 **Definition of product requirements of a MR compatible bone biopsy system using workflow analysis**
Axel Boese; Marco Schmidt (Otto-von-Guericke-University Magdeburg, DE); Thomas Neumuth (Universität Leipzig, DE); Georg Rose (Otto-von-Guericke-University Magdeburg, DE)
- 18:15 **User-friendly design of a drug delivery system for Parkinson patients**
Alexander Steffen; Tobias Walke (User Interface Design GmbH, DE)

19:00 - 20:30 **Gala Concert** (Auditorium Friedrich Schiller University)

20:30 - 22:30 **Social Event** (Dinner at the Zeiss-Planetarium Jena)

Room: HS1

Keynote 5

08:30 **Strahlentherapie von Krebs mit laserbeschleunigten Ionen – eine Vision**

Roland Sauerbrey (Helmholtz-Zentrum Dresden-Rossendorf (HZDR), DE)

Experimente und klinische Studien, die seit den 70er Jahren durchgeführt werden, zeigen die Überlegenheit von Ionen bei der Strahlentherapie von bestimmten Krebsarten. Das Potential von Ionen für die Strahlentherapie insgesamt ist noch nicht vollständig bekannt und derzeit Gegenstand der klinischen Forschung. Für die Ionenbehandlung werden Protonen von etwa 200 MeV Energie bzw. Ionen mit einer Energie von 400 MeV/Nukleon und Strahlendosen von einigen 10 Gray benötigt. Konventionelle Beschleuniger können diese Parameter zur Verfügung stellen. Für ein Behandlungssystem mit Ionen ist jedoch eine sehr aufwändige Apparatur zur Ionenbeschleunigung und Ionenstrahlführung erforderlich, die hohe Investitionskosten verursacht. Am Helmholtz-Zentrum Dresden-Rossendorf (HZDR) wird eine neue Methode zur Beschleunigung von Ionen mit Hochintensitätslasern verfolgt sowie alternative Technologien zur Ionenstrahlführung untersucht, um kompaktere und preisgünstigere Ionenbestrahlungsplätze zu realisieren. Die gemeinsame Plattform OncoRay der Technischen Universität Dresden, des Uniklinikums Dresden und des HZDR bietet die Möglichkeit der translationalen Krebsforschung auf diesem Zukunftsgebiet.

09:15 - 09:30 Break

Room: HS1 [Presentations in German]

Track F

FS: Biosignals meet Apps

Chairs: Thomas Schanze (Technische Hochschule Mittelhessen THM, DE); Michael Schiek (Forschungszentrum Jülich, DE)

09:30 **Biosignals meet Apps - Future application scenarios and current obstacles**

Michael Schiek (Forschungszentrum Jülich, DE)

09:45 **Biosignal analysis implemented on state of the art smartphone dual-core processors**

Ulrich G. Hofmann (University of Freiburg, DE); Sudil Joshi; Kunal Mankodiya; Matthias Klostermann; Ryan Nasreddine (University of Luebeck, DE)

10:00 **Teaching model-based development methods for biomedical signal processing to sensitize and motivate for accuracy and product quality**

Thomas Felderhoff (University of Applied Sciences and Arts Dortmund, DE)

10:15 **Anti Stress App**

Hagen Malberg (Technische Universität Dresden, DE)

10:30 **Intelligent Telemetric Implants**

Martin Schuettler; Thomas Stieglitz (University of Freiburg, DE)

10:45 **Informed Consent applied to ambient biosignal analysis**

Alexander Rachmann (Hochschule Niederrhein, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS2** [Presentations in English] **Track C****FS: MR guided Interventions and Surgery**

Chairs: *Andreas Melzer (University of Dundee, UK); Ulf Teichgräber (Universitätsklinikum Jena, DE)*

- 09:30 **High-frequency transducer for MR-guided FUS**
Spiros Kotopoulos (The University of Hull, UK); Han Wang; Alexander Cochran (University of Dundee, UK); Michiel Postema (University of Bergen, NO)
- 09:45 **Development of a pneumatic x-ray transparent and MR-safe bone drilling system for interventional MRI**
Felix Güttler (University Hospital Jena, DE); Kim Winterwerber (MGB Endoskopische Geräte GmbH Berlin, DE); Andreas Heinrich; Ulf Teichgräber (University Hospital Jena, DE)
- 10:00 **MR enhancing vascular and cardiovascular Implants**
Erwin Immel; Rachel Toomey; Andreas Melzer (University of Dundee, UK)
- 10:15 **Response of Thiel-embalmed Human Liver and Kidney to MR-guided Focused Ultrasound Surgery**
Ioannis Karakitsios; Timur Saliev; Helen McLeod; Roos Eisma; Andreas Melzer; Sarfraz Ahmad (University of Dundee, UK)
- 10:30 **Iron-Platinum Alloy Nanoparticles for Guidewire and Resonant Markers for Catheter Localization during Interventional MRI**
Martin Rube; Benjamin Cox; Mariana Gueorguieva (University of Dundee, UK); Dhanapriya Kakching-tabam; Pascal Andre (University of St. Andrews, UK); Andreas Melzer (University of Dundee, UK)

Room: **HS3** [Presentations in German] **Track G****Innovative Methods in Tissue Engineering & Regenerative Medicine**

Chairs: *Katrin Sternberg (Universität Rostock, DE); Matthias Wilhelm (Medizinische Hochschule Hannover, DE)*

- 09:30 **Synergistic control of mesenchymal stem cell differentiation by nanotopography and immobilized BMP-2 on TiO₂ nanotubes**
Sebastian Bauer (University of Erlangen-Nuremberg, DE)
- 09:45 **Design Optimization of an Electrowetting Cell Sorter Chip Platform**
Bastian Goellner; Daniel Kerckhoff; Ulrike Michelsen; Moritz Padberg (Bartels Mikrotechnik GmbH, DE); Fedor Schreiber; Daniel Erni (University of Duisburg-Essen, DE)
- 10:00 **Hollow fibres integrated in a microfluidic cell culture system**
Claudia Winkelmann; Frank Sonntag (Fraunhofer Institut für Werkstoff- und Strahltechnik Dresden, DE); Michael Gelinsky (Technische Universität Dresden, DE); Uwe Marx (TissUse GmbH, DE); Anja Lode (Technische Universität Dresden, DE)
- 10:15 **Ventilation-analogue mechanostimulation of lung epithelial cells in vitro**
Katharina Gamerdinger; Stefan Schumann; Eva Smudde; Josef Guttman (University Medical Center of Freiburg, DE)
- 10:30 **Immobilization and controlled release of vascular and bone growth factors on bone replacement materials**
Kristin Zurlinden; Markus Laub (MorphoPlant GmbH, DE); Daniel S Dohle; Herbert Jennissen (Universität Duisburg-Essen, DE)
- 10:45 **Textile Reinforcement of Fibrin Based Tissue Engineered Heart Valves**
Robin Ross; Barbara Hegge; Petra Mela; Thomas Gries; Stefan Jockenhoewel (RWTH Aachen University, DE)

Room: HS4 [Presentations in English] Track N

Telemedicine

Chairs: Georg Fischer (University Erlangen-Nuremberg & Eesy-id, DE); Albrecht Urbaszek (Biotronik SE & Co. KG, DE)

- 09:30 **Telemonitoring-System and central real time data processing for Preventive Medicine Research**
Sebastian Neubert; Sabine Behrendt; Annika Rieger; Mohit Kumar (University of Rostock, DE); Kerstin Thurow (Center for Life Science Automation - CELI-SCA, DE); Regina Stoll (University of Rostock, DE)
- 09:50 **Development of an Android App in compliance with the Continua Health Alliance Design Guidelines for medical device connectivity in mHealth**
Matthias Frohner; Philipp Urbauer; Mathias Forjan; Birgit Pohn; Ferenc Gerbovics; Stefan Sauermann; Alexander Mense (University of Applied Sciences Technikum Wien, AT)
- 10:10 **Service based adhoc networking for patient's pain diary on mobile devices**
Thomas Michalski (ISIP, DE); Matteo Bonsanto; Volker Tronnier (University Hospital Schleswig-Holstein, DE); Jörg-Uwe Meyer (Mt2it, DE); Ulrich G. Hofmann (University of Freiburg, DE)
- 10:30 **Home telecare and rehabilitation system with aspect oriented functional integration**
Alar Kuusik; Enar Reilent; Külli Sarna (ELIKO Technology Competence Centre, Estonia); Marko Parve (East-Tallinn Central Hospital, Estonia)
- 10:50 **Telemedical monitored training for patients with chronic pulmonary disease**
Keywan Ali Sohrabi (ThoraTech GmbH, DE); Lothar Leiche (IfM GmbH, DE); Andreas Weissflog (ThoraTech GmbH, DE); Henning Schneider (Fachhochschule Giessen Friedberg, DE); Ulrich Koehler (Philipps-Universität Marburg, DE); Volker Gross (Technische Hochschule Mittelhessen, DE)
- 11:10 **Results from long-term In-vivo Tests of a Wireless, Intravascular Blood-Pressure Monitoring System for Hypertension Patients**
Nina Cleven (RWTH Aachen University, DE); Anna Voitok; Tobias Penzkofer; Peter Isfort (RWTH Aachen University Hospital, DE); Michael Görtz (Fraunhofer IMS, DE); Thorsten Goettsche (OSYPKA AG, DE); Ulrich Steineseifer; Thomas Schmitz-Rode (RWTH Aachen University, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: HS5 [Presentations in English/German] Track E

Biosensors and Bioanalytics (4)

Chairs: Hoc Khiem Trieu (TU Hamburg-Harburg, DE); Jürgen Popp (Institut of Photonic Technology, DE)

- 09:30 **CMOS based capacitive biosensor with integrated tethered bilayer lipid membrane for real-time measurements**
Sarah Kibler; Sebastien Pierrat; Tom Zimmermann; Holger Vogt (Fraunhofer IMS, DE); Hoc Khiem Trieu (TU Hamburg-Harburg, DE); Ingo Köper (Flinders University Adelaide, AU)
- 09:45 **A Novel Bioassay for the Rapid Detection of E. coli**
Susanne Pahlow; Martha Schwarz; Karina Weber (Friedrich Schiller University Jena, DE); Jürgen Popp (Institut of Photonic Technology Jena, DE)
- 10:00 **Application of an electronic nose to detect head and neck cancer from exhaled breath**
Katharina Witt (University of Applied Sciences Jena, DE); Johanna Inhestern (Friedrich-Schiller-University Jena, DE); Orlando Guntinas-Lichius (Universitätsklinikum Jena, DE); Andreas Voss (University of Applied Sciences Jena, DE)
- 10:15 **Optimizing a magnetic sensor vest for cardiac source imaging**
Stephan Lau (Ilmenau Technical University & University of Melbourne & Biomagnetic Center Jena, DE); Bojana Petkovic (Ilmenau Technical University, DE); Luca Di Rienzo (Politecnico di Milano, IT); Jens Hauelsen (Ilmenau Technical University, DE)
- 10:30 **TUG Test Instrumentation for Parkinson's disease patients using Inertial Sensors and Dynamic Time Warping**
Miguel Reyes Adame (Furtwangen University, DE); Ahmed Al-Jawad; Michailas Romanovas (HSG-IMIT, DE); Markus Hobert; Walter Maetzler (University of Tuebingen, DE); Knut Moeller (Furtwangen University, DE); Yiannos Manoli (University of Freiburg, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS6** [Presentations in English/German] Track **R**

Technologies for Rehabilitation and Prevention

Chairs: Marc Kraft, Thomas Schauer (Technische Universität Berlin, DE)

- 09:30 **Decubitus prophylaxes in surgery: A novel approach using active load controlled bedding system**
David Hradetzky (University of Applied Sciences Northwestern Switzerland, CH); Dominik Messerli (Messerli & Partner GmbH, CH); Sabrina Harsch; Matthias Jeker; Stephan Böhringer; Erik Schkommodau (University of Applied Sciences Northwestern Switzerland, CH)
- 09:45 **Introduction to an Automated Support to Adapt Therapeutic Exercises to Changing Training Conditions**
Daniel Pollig (RWTH Aachen University, DE); Iris Borowski-Mashi; Fritz-Uwe Niethard (Orthopädische Klinik der RWTH Aachen, DE); Catherine Disselhorst-Klug (RWTH Aachen University, DE)
- 10:00 **Breathing synchronized electrical stimulation of the abdominal muscles in patients with acute tetraplegia**
Thomas Schauer; Ralph Stephan (Technische Universität Berlin, DE); Andreas Niedeggen; Thomas Liebscher; Jeanette Dorian; Rainer Seidl (Unfallkrankenhaus Berlin, DE)
- 10:15 **Patient Supervision During Endeffector Based Robot Assisted Rehabilitation of Upper Extremities**
Michael Hennes; Kai Bollue; Henry Arenbeck; Dirk Abel; Catherine Disselhorst-Klug (RWTH Aachen University, DE)
- 10:30 **Analyse von Druckverteilungsmustern bei Kindern mit Haltungsschwäche**
Susanne Koch; Susan Arnold; Ralf Zeckay; Grzegorz Sliwinski; Christine Thiele (Technische Universität Dresden, DE); Wojtek Kufel (Rehabilitationszentrum Zgorzelec, PL); Zbigniew Sliwinski (Humanistic and Nature University in Kielce, PL); Hagen Malberg (Technische Universität Dresden, DE)
- 10:45 **Non-invasive transcutaneous stimulation of the human lumbar spinal cord facilitates locomotor output in spinal cord injury**
Winfried Mayr; Karen Minassian (Medical University of Vienna, AT); Keith Tansey (Shepherd Center, Atlanta, USA); Frank Rattay (Vienna University of Technology, AT); Simon Danner; Matthias Krenn; Ursula Hofstoetter (Medical University of Vienna, AT); Milan Dimitrijevic (Baylor College, Houston, Texas, USA)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS7** [Presentations in English/German] Track **I**

FS: The High-Tech Operating Room – Practical Experiences with the Newest Medical Devices for Therapy and Diagnosis

Chairs: Iris Bings (Fachverband Biomedizinische Technik e.V., DE); Jürgen Nippa (Fa. EURITIM, DE)

- 09:30 **Processes in the OR**
Rainer Tuschmann (H2O, DE)
- 09:45 **Imaging meets Surgery – The Hybrid OR**
Clemens Bulitta (Siemens AG Healthcare Sector, DE)
- 10:00 **Form follows function - VAO Process Simulation for safer, better and more objective decisions**
Klaus Kühn (Institut für Angewandte Simulation, DE)
- 10:15 **"E-Seminars" – Cost efficient training can improve operational safety in the OR**
Holger Hörz (Universe Emedia GmbH, DE)

11:00 - 11:30 Coffee break - Trade Exhibition

Room: **HS8** [Presentations in German] **Track** **L****FS: Hypothermia**

Chairs: Sebastian Brandt (University of Lübeck & University Medical Center Schleswig-Holstein, DE);

Michael Imhoff (Ruhr-University Bochum, DE)

- 09:30 **Pathophysiology and epidemiology of accidental hypothermia**
Thorsten Perl (University of Goettingen, DE)
- 09:45 **Detection and Assessment of Accidental Hypothermia**
Oliver Kimberger (Medizinische Universität Wien, AT)
- 10:00 **Warming methods for protecting against hypothermia**
Karl Peter Ittner (Universitätsklinikum Regensburg, DE)
- 10:15 **Thermo-Management for Accidental Hypothermia**
Jochim Koch (Drägerwerk AG & Co. KGaA, DE); Sebastian Brandt (University of Lübeck & University Medical Center Schleswig-Holstein, DE); Michael Imhoff (Ruhr-University Bochum, DE)
- 10:30 **Prophylaxis of Accidental Hypothermia**
Sebastian Brandt (University of Lübeck & University Medical Center Schleswig-Holstein, DE)
- 10:45 **Cost effectiveness of preventing perioperative Hypothermia**
Thomas Henne (Member of DGBMT Workshop Detection, Prevention and Treatment of Accidental Hypothermia & 3M, DE)

Room: **HS1****Keynote 6**11:30 **Optical coherence tomography - from research to routine medical diagnostics**

Michael Kempe (Carl Zeiss AG Corporate Research & Technology Jena, DE)

In the field of biomedical optics, Optical Coherence Tomography (OCT) is one of the success stories of transition from research to routine medical diagnostics. This talk will focus on OCT as an interesting case study for successful technologies in the medical field, in particular in ophthalmology.

Despite being a unique solution for the technical problems of imaging into the eye, it took more than 15 years to establish OCT as a routine diagnostic tool in ophthalmology. The presentation will highlight the technical and clinical milestones that drove this development. One of the technical milestones was the transition from time-domain OCT to spectral-domain OCT that enabled substantially more sensitive detection and therefore faster imaging. It makes the acquisition of large 3D volumes within the eye and real-time visualization, e.g. for surgical procedures, possible. The research in OCT for ophthalmology continues to be a highly active field with regard to new technical developments and clinical applications. The introduction of swept-source OCT could be another technology shift leading to even higher imaging speeds. But new technologies do not automatically substitute old ones. The clinical value as the ultimate driver of adoption depends on a number of factors that will be discussed.

OCT has also been recognized as interesting optical technology for other medical applications as well. Substantial research went into establishing OCT as diagnostic modality in e.g. tumor diagnostics (optical biopsy) and cardio-vascular imaging. Being likely one of the most prominent technologies in biomedical optical imaging research, its clinical use remains limited. Catheter-based cardio-vascular imaging has emerged as the next big application of OCT in medicine. As is the case in ophthalmology too, its success as diagnostic tool is linked to the development of novel therapeutic interventions.

Room: **HS1** [Presentations in English] **Track F****FS: A psychiatric perspective on autonomic function**

Chairs: Karl Jürgen Bär (University Hospital Jena, DE);
Andreas Voß (University of Applied Sciences Jena, DE)

- 13:00 **Neurovisceral Integration: Implications for Psychopathology**
Julian Thayer (Ohio State University, USA)
- 13:30 **Automatic regulation in Alzheimer's disease**
Vikram Yeragani (University of Alberta, Edmonton, CA)
- 13:45 **Depression-related abnormalities in circadian rhythm of cardiac autonomic activity in survivors of acute coronary syndromes**
M Ladrón De Guevara (School of Psychology Buennos Aires, AR); Maria Castro (FLENI, AR); S Vigo (CONICET, AR); D Gustafson (State University of New York, DE); I Vila-Pérez (Hospital Vall D'Hebron, DE); D Cardinali (CONICET, DE); Salvador Guinjoan (FLENI, AR)
- 14:00 **Respiratory variability and cardiorespiratory coupling analyses in patients suffering from schizophrenia and their healthy first-degree relatives**
Steffen Schulz (University of Applied Sciences Jena, DE); Karl Jürgen Bär (University Hospital Jena, DE); Andreas Voss (University of Applied Sciences Jena, DE)
- 14:15 **Physical fitness and autonomic dysbalance in schizophrenia**
Karl Jürgen Bär (University Hospital Jena, DE); Marco Herbsleb (University of Jena, DE); Steffen Schulz (University of Applied Sciences Jena, DE); Tobias Rachow (University Hospital, Jena, DE); Daniela Eisentraeger; Christian Puta; Holger Gabriel (University of Jena, DE); Andreas Voss (University of Applied Sciences Jena, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS2** [Presentations in English] **Track C****FS: MR guided Interventions and Surgery (2)**

Chairs: Andreas Melzer (University of Dundee, UK);
Ulf Teichgräber (Universitätsklinikum Jena, DE)

- 13:00 **Introduction of an open source middleware for automatic FOV adjustment in interactive MRI according to a medical tracking-system**
Felix Güttler (University Hospital Jena, DE); Peter Krauß; Jonathan Guntermann (Charité - Universitätsmedizin Berlin, DE); Andreas Heinrich; Ulf Teichgräber (University Hospital Jena, DE)
- 13:30 **MR testing of gradient-induced vibrations using an optical contact-free sensor within the switched gradient magnetic field of a 1.5 Tesla MR system**
Gregor Schaefers (MR:comp GmbH, DE)
- 13:50 **Workflow for image-guided interventions: Characterisation and Validation. Towards the Integrated Imaging Operating Room of the future**
Fabiola Fernandez-Gutierrez (University of Dundee, UK); Avril Barclay; Thomas Martin (Ninewells Hospital, UK); Ole Elle (Oslo University Hospital, NO); Graeme Houston (Ninewells Hospital, UK); Andreas Melzer (University of Dundee, UK)
- 14:10 **MR real-time tracking of hepatic motion during respiration in a Thiel Soft-fix cadaver**
Benjamin Cox; Helen McLeod; Martin Rube (University of Dundee, UK); Sarah Vinnicombe (University of Dundee & NHS Tayside, UK); Andrew B Holbrook (Stanford University, USA); Roos Eisma; Timur Saliev; Ioannis Karakitsios; Andreas Melzer (University of Dundee, UK)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS3** [Presentations in English/German] **Track G****Quality Management and Regulations in Regenerative Medicine**

Chairs: Stefan Jockenhoevel (RWTH Aachen University, DE); Sabine Kloth (University of Regensburg & TÜV SÜD Product Service GmbH, DE)

- 13:00 **ISO standard 13022 – A novel tool for the management of risk of cell based products**
Sabine Kloth (University of Regensburg & TÜV SÜD Product Service GmbH, DE)
- 13:15 **Setting Standards for Technologies in Regenerative Medicine**
Elisabeth Leitner; Petra Bischoff (DIN Deutsches Institut für Normung e. V., DE)
- 13:30 **Capacitive Sensor Concept for Monitoring Neuronal Activity in Vitro**
Jacqueline Weber; Daniel Laqua; Adam Williamson; Peter Husar; Andreas Schober (Ilmenau University of Technology, DE)
- 13:45 **Comparison of Optical and Biomechanical Properties of Native and Artificial Equine Joint Cartilage under Load using NIR Spectroscopy**
Martin Hoffmann; Matthias Lange; Florian Meuche; Thomas Reuter (fzmb GmbH, DE); Holger Plettenberg (Arthrospec GmbH, DE); Gunter Spahn (Center of Trauma and Orthopaedic Surgery Eisenach, DE); Igor Ponomarev (fzmb GmbH, DE)
- 14:00 **Influence of cell source and adhesion substrate on growth factor responsiveness in primary endothelial cells**
Thilo Storm; Michael Teske; Marian Löbler; Katharina Wulf; Klaus-Peter Schmitz; Katrin Sternberg (University of Rostock, DE)
- 14:15 **Non-invasive Imaging of Tissue-Engineered Vascular Endothelium with Iron Oxide Nanoparticles**
Julia Frese; Ladislav Hrdlicka; Marianne Mertens; Lisanne Rongen; Sabine Koch; Philipp Schuster; Valentine Gesché; Twan Lammers; Petra Mela (RWTH Aachen University, DE); Fabian Kiessling (University Hospital Aachen, DE); Stefan Jockenhoevel (RWTH Aachen University, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS4** [Presentations in German] **Track N****FS: Intelligent Sensors**

Chairs: Christian Weigand (Fraunhofer IIS, DE); Georg Fischer (University Erlangen-Nuremberg & Eesy-id, DE)

- 13:00 **Requirement engineering in health care and telemedicine**
Andreas Tobola; Christian Hofmann; Christian Weigand (Fraunhofer Institute for Integrated Circuits IIS, DE)
- 13:15 **A Low-Power Embedded Communication Platform for Medical Applications**
André Schwarzmeier (University of Erlangen-Nuremberg, DE); Lukas Reuter (EESY-ID, DE); Juan Mena-Carrillo; Werner Weber (Infineon Technologies AG, DE); Georg Fischer (University Erlangen-Nuremberg & EESY-ID, DE); Robert Weigel; Dietmar Kissinger (University of Erlangen-Nuremberg, DE)
- 13:30 **Energy budget in mobile health assistance systems**
Lukas Reuter (EESY-ID, DE); André Schwarzmeier; Robert Weigel; Georg Fischer (University Erlangen-Nuremberg & EESY-ID, DE)
- 13:45 **Method for daily-life movement classification of elderly people**
Martin Rulsch (Fraunhofer Institute for Integrated Circuits, DE); Janine Busse (IDC International DiaLog College and Research Institute GmbH, DE); Matthias Struck; Christian Weigand (Fraunhofer Institute for Integrated Circuits, DE)
- 14:00 **Effectiveness and efficiency for ambulatory care assisted by mobile technological devices**
Jürgen Zerth; Juergen Besser; Anika Reichert (International DiaLog College and Research Institute, DE)
- 14:15 **Heart failure monitoring with implantable defibrillators**
Jens Kirchner (Biotronik SE & Co. KG, DE); Martin Arnold; Claudia Beckendorf (Universitätsklinikum Erlangen, DE); Stefan Paule; Gerald Czygan (Biotronik SE & Co. KG, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS5** [Presentations in German] **Track E****Biosensors and Bioanalytics (5)**

Chair: Wilfried Mokwa (RWTH Aachen, DE)

- 13:00 **Signal Quality of Titanium and Titanium Nitride Coated Dry Polymer Electrodes**
Patrique Fiedler; Sebastian Biller (Ilmenau University of Technology, DE); Fonseca (INEB, PT); Filipe Vaz (Universidade do Minho, PT); Stefan Griebel (Ilmenau University of Technology, DE); Frank Zanow (Eemagine Medical Imaging Solutions GmbH, DE); Jens Haueisen (Technical University Ilmenau, DE)
- 13:15 **Miniaturization and characterization of a nano flow sensor for intelligent implants**
Joerg Schroeter (Research Assisstant, DE)
- 13:30 **Unobtrusive Vital Sign Acquisition in the Domain of AAL**
Björn-Helge Busch; Ralph Welge (Leuphana University Lüneburg, DE)
- 13:45 **Loading method for discrete drug depots on implant surfaces**
Mark Vehse (Universität Rostock, DE); Matthias Gieseke (Laser Zentrum Hannover e.V., DE); Steffen Fiedler; Svea Petersen; Robert Irsig; Volkmar Senz; Marian Löbler (Universität Rostock, DE); Michael Hustedt; Stefan Kaierle; Heinz Haferkamp (Laser Zentrum Hannover e.V., DE); Katrin Sternberg; Klaus-Peter Schmitz; Stefan Lochbrunner; Karl-Heinz Meiwes-Broer; Hermann Seitz (Universität Rostock, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS6** [Presentations in German] **Track R****FS: Assistance Systems for Orthopaedic Applications**

Chairs: Thorsten Meiss (Technische Universität Darmstadt, DE); Daniel Heitzmann (Heidelberg University Clinics & Dept. of Orthopedics, Trauma Surgery and Paraplegiology, DE)

- 13:00 **Active Knee Orthoses – Technical Considerations and Applications**
Roman Müller; Peter Pott; Helmut F. Schlaak (Technische Universität Darmstadt, DE)
- 13:15 **Active Knee Orthosis for Supporting the Elderly**
Markus Grün; Thorsten Meiss; Roman Müller (Technische Universität Darmstadt, DE); Julia Block; Daniel Heitzmann; Stefan van Drongelen; Michele Vanoncini; Sebastian Wolf (Heidelberg University Clinics, DE); Peter Pott; Helmut F. Schlaak; Roland Werthschützky; Ulrich Konigorski (Technische Universität Darmstadt, DE)
- 13:30 **A prototyping environment for evaluation of man-machine interfaces based on electromyographic activity**
Andreas Bartschat (DHBW Karlsruhe & KIT, DE); Markus Reischl (Karlsruhe Institute of Technology (KIT), DE)
- 13:45 **Active driven prosthesis using a bevel helical gearbox in combination with a brushless dc-motor**
Bernhard Budaker (Fraunhofer IPA, DE)
- 14:00 **Power support by an active knee orthosis during sit to stand**
Sebastian Wolf (Heidelberg University Clinics, DE); Markus Grün; Roman Müller (Technische Universität Darmstadt, DE)
- 14:15 **User-Centered Prosthetic Development: Comprehension of Amputees' Needs**
Oliver Christ; Mario Jokisch; Julia Preller; Philipp Beckerle; Janis Wojtus; Stephan Rinderknecht; Oskar von Stryk; Joachim Vogt (Technische Universität Darmstadt, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Room: **HS7** [Presentations in English/German] **Track I**

Clinical Engineering

Chair: Frank Rothe (Vamed, DE)

- 13:00 **Risk analysis for catheter guided Aortic valve implantations**
Reem Rosen (Hochschule Furtwangen & Karlsruhe Institute of Technology, DE); Sebastian Ritterbusch (Karlsruhe Institute of Technology, DE); Knut Möller (Hochschule Furtwangen, DE); Vincent Heuveline (Karlsruhe Institute of Technology, DE)
- 13:15 **Novel semi-invasive left-heart electrogram feature to select patients with atrial fibrillation for cardiac resynchronization**
Katharina Kroll; Kirsten Rotter (University of Rostock, DE); Matthias Heinke (University of Jena, DE); Juraj Melicherik (MediClin Herzzentrum Lahr, DE); Christoph Nienaber; Bruno Ismer (University of Rostock, DE)
- 13:30 **Signal averaging transesophageal left heart ECG software to evaluate left atrial conduction delay and left ventricular conduction delay in heart failure patients with dilated and ischaemic cardiomyopathy**
Martin Lorenz (University of Jena, DE); Bruno Ismer (Offenburg University of Applied Sciences, DE); Kerstin Straube (C. R. Bard GmbH, DE); Hans Reiner Figulla; Matthias Heinke (University of Jena, DE)
- 13:45 **Utilization of a Navigated Robot Assistance System for Microsurgical Neurosurgery**
Stephanie Sahm (University of Siegen, DE); Frank Duffner (University of Tübingen, DE); Hubert J. Roth; Jürgen Wahrburg (University of Siegen, DE)
- 14:00 **Evaluation model of an extracorporeal gas exchange device made of silicone rubber**
Tina Rieper (University of Freiburg, DE); Bettina Wehrstein; Andreas N. Maurer (Novalung GmbH, DE); Claas Mueller; Holger Reinecke (Universität Freiburg, DE)
- 14:15 **Concept of a Movable Flat Panel Detector for X-ray Imaging during Surgical Interventions**
Sebastian Engel; Marc Käseberg (Fraunhofer-Institute for Production Systems and Design Technology IPK, DE); Fabian Stopp (Charité - Universitätsmedizin Berlin, DE); Felix Fehlhaber (Fraunhofer-Institute for Production Systems and Design Technology IPK, DE); Erwin Keeve (Charité - Universitätsmedizin Berlin, DE)

14:30 - 14:45 Break

14:45 - 15:15 Closing Ceremony • 15:30 - 17:00 Excursions

Social Events



17-09-2012, 19:00 – 20:30 h, Room HS1, ground floor

Opening ceremony and greetings

(Speakers and presentations, see page 10–11)

17-09-2012, 20:30 – 22:00 h, Foyer, ground floor

Get-Together

After the formal opening of the conference we would like to welcome you with a selected buffet and drinks from 20:30 h. Participants in the BMT 2012 can conclude the first conference day in a relaxed atmosphere. Participation is included in the conference fee. We hope you enjoy the evening and have interesting talks.

18-09-2012, 19:00 – 20:30 h, Auditorium,
Friedrich Schiller University Jena (Schloßgasse 1)

Gala concert of the impulse region on the occasion of the BMT

Recorder and piano music of 5 centuries will be played by “Conventus tibicinus”. Participation in the gala concert is free of charge for participants in the BMT 2012.

After the concert, those who are interested may participate in a **“Very special kind of night time city walk”** with Dipl.-Ing. Karl-Heinz Kraass (representative of the impulse region Erfurt-Weimar-Jena-Weimarer Land). The city walk ends directly at the Zeiss-Planetarium, in time for the beginning of the Social Event of the BMT 2012.

Meeting point: University main building, entrance - Schloßgasse 1

18-09-2012, 20:30 – 22:30 h, Zeiss-Planetarium Jena,
Am Planetarium 5, 07743 Jena

Social evening: Special dinner at Zeiss-Planetarium Jena

Enjoy a unique and unforgettable dinner at Zeiss-Planetarium Jena, the world's oldest planetarium opened in 1926. **Undisturbed by the city lights in the planetarium you can admire glittering and twinkling stars and listen to the mysterious tales about the starry sky.**



As the main speaker we welcome **Mr Matthias Machnig**, Minister of the Thuringian Ministry of Economy, Employment and Technology.

Price: EUR 60,- per person. The reservation can also be made via the registration form. The number of participants is limited to max. 200 people (ticket assignment will be done on a first-come, first-served basis). All conference materials will be handed out to the participants at the conference counter.

Address:
Zeiss-Planetarium Jena
Am Planetarium 5
07743 Jena

For navigation see programme page 146.



Visit the scientific Beutenberg Campus

In December 1998 the Beutenberg-Campus Jena e.V. was founded. It provides a platform for the development of innovative strategies and also serves to encourage cooperation among its members. In addition, the association represents the interests of the research establishments and start-up centres. There are nine research institutes on the Campus including the Leibniz-Gemeinschaft, Max-Planck-Gesellschaft, and Fraunhofer-Gesellschaft doing research at state-of-the-art level. The two start-up centres do business under the names of Technologie- und Innovationspark Jena (TIP) and Biolstrumentezentrum. They host more than fifty small biotechnology companies doing research for marketable products.

The following institutes can be visited:

- Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), Jena
- Institute of Photonic Technology (IPHT), Jena
- Biolstrumentation Centre /BioCentiv GmbH, Jena
- Technology and Innovation Park Jena (TIP)

Another highlight:

Visit the Biomagnetic Center (Clinic for Neurology of the University Hospital Jena) under the expert direction of Dr. Huonker, Head of Biomagnetic Center.

Date & Time: 19-09-2012, 15:30 h (90 minutes)

Meeting point: BMT 2012 conference counter
(foyer, ground floor)

Registration: till 18-09-2012; conference counter



17 to 19-09-2012, Foyer, ground floor

The conference is accompanied by a trade exhibition. Present your products, services and research expertise to decision makers at hospitals and from industry at the trade exhibition. Available areas are located on the ground floor and first floor of the Friedrich Schiller University Jena campus building close to the conference rooms, the poster exhibition and the conference secretariat. The conference breaks and the get-together on the evening of 17-09-2012 will also take place in this area.

Dates:

Monday, 17-09-2012	08:00 - 22:00 h
Tuesday, 18-09-2012	08:00 - 18:30 h
Wednesday, 19-09-2012	08:00 - 14:45 h

We would like to thank our exhibitors, partners and sponsors:

- AKM Innovationsmanagement GmbH, Aachen
- Bartels Mikrotechnik GmbH, Dortmund
- CSA Group, Toronto/Frankfurt
- Fraunhofer IZM, Berlin
- INKA - Intelligent Catheter, Magdeburg
- Institut für Mikrotechnik Mainz GmbH, Mainz
- Landesentwicklungsgesellschaft Thüringen mbH (LEG Thüringen), Erfurt
- MedizinTechnik NRW GbR - Cluster MedizinTechnik.NRW, Düsseldorf
- medways e.V., Jena
- microfluidic ChipShop GmbH, Jena
- MR:comp GmbH, Gelsenkirchen
- SONOTEC Ultraschallsensorik Halle GmbH, Halle
- Springer-Verlag GmbH, Heidelberg
- Thuringian Ministry for Economy, Labor and Technology, Erfurt
- Universität Rostock, IBMT, IIB e.V., BMBF-Projekt >>REMEDI<<, Rostock
- VDE MedTech, Frankfurt
- Walter de Gruyter GmbH & Co. KG, Berlin



Once again this year, the DGBMT awards the DGBMT prize of the Klee family foundation endowed with EUR 5 000 for the promotion of young scientists. The seven-member jury team from the areas of science and teaching, clinical use and industry represents both the biological-medical and the scientific-technical field of activity of Biomedical Engineering. The jury assessed a total of 9 qualified papers.

The winner of the DGBMT prize of the Klee family foundation in 2012 was:

Dr.-Ing. Frank Michael Weber
Karlsruhe University
with his paper on

Personalizing Simulations of the Human Atria



The **prize-giving ceremony and the laudatory speech** for the winner will take place on the occasion of the opening event at Friedrich Schiller University Jena, (HS1) on **17-09-2012 at 19:00 h**. The prize will be awarded by Prof. Dr. Olaf Dössel, chairman of the DGBMT prize committee.



The BMT 2012 is taken as an occasion to host the DGBMT student competition.

This year 21 students have participated. The best three papers – submitted as posters or oral presentations – will receive certificates and prizes.

The assessment at the conference is based on the following criteria:

- Scientific content of the paper
- Scientific content of the presentation
- Quality of the presentation
- Timing in the presentation
- Demonstration of competence in the discussion.

Prizes will be as follows:

1st prize: EUR 1 000

2nd prize: EUR 600

3rd prize: EUR 400

The announcement of the winners and the award of certificates takes place at the closing event of the conference on **19-09-2012 from 14:45 h** (HS1).

The awards are published after the conference both in the DGBMT members' magazine "Health Technologies" and on the DGBMT homepage.

► www.vde.com/dgbmt



Conference documents

You will receive your personal conference badge and the conference documents during the opening hours of the conference counter at Friedrich Schiller University Jena.

Conference language

The conference languages are German and English.

Poster session

Posters can be hung up and displayed from 17-09-2012, 9:00 h. During the poster session on 18-09-2012 from 15:00 – 16:30 h authors will present their works and will be available for your questions.

BMT Proceedings – online access

All accepted abstracts will be published online as a supplement to the regular volume of the Biomedical Engineering journal in the Walter de Gruyter (WdG) publishing house. All accepted abstracts and conference papers will also be prepared by WdG to be listed in PubMed.

Accepted abstracts and conference papers will be freely available on <http://dx.doi.org/10.1515/bmte> (WdG).

All information provided here was recorded to the best of our knowledge and represents our state of knowledge at the time of printing.

Conference secretariat

VDE Conference Service
 Stresemannallee 15
 60596 Frankfurt/Main
 Tel.: +49 (0) 69 6308-477
 Fax: +49 (0) 69 6308-144
 E-mail: vde-conferences@vde.com

Conference counter (Foyer, ground floor)

Friedrich Schiller University Jena
 University Campus
 Carl-Zeiss-Straße 3
 07743 Jena

Opening hours of the conference counter

Sunday, 16-09-12	16:00 – 18:00 h
Monday, 17-09-12	07:30 – 18:30 h
Tuesday, 18-09-12	08:00 – 18:30 h
Wednesday, 19-09-12	07:30 – 15:15 h

You can register via our Online-Registration system on www.bmt2012.de.

The conference fee includes:

- free online access to abstracts and conference papers,
- the printed conference programme,
- the daily coffee-breaks and lunches,
- get-together on September 17, 2012 in the lecture hall complex at the Friedrich Schiller University Jena and
- free entry to the BMT 2012 gala concert »recorder and piano music of 5 centuries«, organized by »Implusregion Erfurt | Weimar | Jena« on September 18, 19 o'clock.

As a social event of the BMT 2012, we offer a special evening on September 18, 2012 at the Zeiss-Planetarium in Jena. Price: EUR 60,- per person. The reservation can also be done via the registration form. The number of participants is limited to max. 200 people (ticket assignment will be done on a first-come, first-served basis).

All the conference materials will be handed out at the conference registration desk to the participants.

Registration fees	Regular (from 23-7-2012)
Member VDE, DGBMT*	
Institute, University, Clinic	EUR 370,-
Student**	EUR 70,-
PhD Student**	EUR 160,-
Personal Member	EUR 510,-

Take advantage of the VDE/DGBMT membership by getting reduced participation fees. The membership is for new members free in the first year.

Registration



Conference Venue Jena



Registration fees	Regular (from 23-7-2012)
Non-Member	
Institute, University, Clinic	EUR 440,-
Student**	EUR 80,-
PhD Student**	EUR 200,-
Non-Member	EUR 580,-

* Participants applying for the membership fee must include the membership number in the registration form.

** For students up to 28 years / PhD students up to 35 years: a photocopy of the student card / certificate must be sent to: vde-conferences@vde.com.

The prices are VAT free.

Cancellation

The cancellation deadline is 4 weeks prior to the event: August 19, 2012. Up to this deadline, the refund of registration fees less EUR 50, - cancellation fee (EUR 30, - for students) is possible.

Welcome to Jena – a city which balances history and high technology

The city of Jena lives on a fascinating combination of its rich historical and intellectual past, its attractive landscape, innovative international research and industry, and its youthful student life. This wealth of different facets creates a unique setting which gives this small, vibrant city its special charm.

Jena's academic and intellectual development

Since the university, the Alma Mater Jenensis, was founded in 1558, Jena has been one of the most famous places to study in Germany. Thanks to its close connection to the nearby seat of the duchy, Weimar, and support from the poet and minister Goethe, at the end of the 18th century, the city on the Saale enjoyed a Classicist period, in which Jena became the most important intellectual centre in Germany.

Jena's economic development

In the second half of the 19th century, Jena developed into a city of industry thanks to the work of the three great scientific and industrial thinkers, Carl Zeiss, Otto Schott and Ernst Abbe. Their cooperation resulted in the world-famous Zeiss works and Jena's Schott and Associates glassworks. This effective cooperation between research institutes and the industrial companies has been maintained until today and is the reason behind Jena's outstanding reputation as a high-tech location.

► www.jena.de

Conference venue Jena

Friedrich Schiller University Jena
University Campus
Carl-Zeiss-Straße 3
07743 Jena



Various rooms have been reserved in a number of Jena hotels and pensions for your accommodation. Please contact your hotel directly for your booking.

HOTELS

IBIS Hotel City am Holzmarkt

Teichgraben 1, 07743 Jena

Tel.: +49 (0)3641 8130, Fax: +49 (0)3641 813333

0,3 Km to Campus

Hotel u. Kneipengallerie Zur Noll

Oberlauengasse 19, 07743 Jena

Tel.: +49 (0)3641/597710, Fax: +49 (0)3641/597720

0,7 Km to Campus

Hotel Schwarzer Bär

Lutherplatz 2, 07743 Jena

Tel.: +49 (0)3641 4060, Fax: +49 (0)3641 406113

1 Km to Campus

Thüringer Sozial Akademie gGmbH

Am Stadion 1, 07749 Jena

Tel.: +49 (0)3641 3030, Fax: +49 (0)3641 303100

2,5 Km to Campus

Steigenberger Maxx

Stauffenbergstr. 59, 07747 Jena/Lobeda

Tel.: +49 (0)3641 300-0, Fax: +49 (0)3641 300888

6 Km to Campus

Best Western Hotel Jena

Rudolstädter Straße 82, 07745 Jena

Tel.: +49 (0)3641 660, Fax: +49 (0)3641 661010

7,6 Km to Campus

Hotel Jembo Park

Rudolstädter Straße 93, 07745 Jena

Tel.: +49 (0)3641 6850, Fax: +49 (0)3641 685299

8,1 Km to Campus

FAIR RESORT Hotel Jena

Ilmnitzer Landstraße 3, 07751 Zöllnitz/Jena

Tel.: +49 (0)3641 7676, Fax: +49 (0)3641 767767

9,3 Km to Campus

Hotel am Schloß Apolda

Jenaer Straße 2, 99510 Apolda

Tel.: +49 (0)3644 5800, Fax: +49 (0)3644 580100

14,8 Km to Campus

Hotel Elephant

Markt 19, 99423 Weimar

Tel.: +49 (0)3643 802-0, Fax: +49 (0)3643 802-610

21,2 Km to Campus

Best Western Premier Grand Hotel Russischer Hof

Goetheplatz 2, 99423 Weimar

Tel.: +49 (0)36 4377-40, Fax: +49 (0)36 4377-4840

22,2 Km to Campus

Dorint Am Goethepark Weimar

Beethovenplatz 1/2, 99423 Weimar

Tel.: +49 (0)3643 872-0, Fax: +49 (0)3643 872-100

24,5 Km to Campus

PENSIONS

Altdeutscher Gasthof "Roter Hirsch"

Holzmarkt 10, 07743 Jena

Tel.: +49 (0)3641 498066, Fax: +49 (0)3641 498055

0,2 Km to Campus

Gasthof Zur Schweiz

Quergasse 15, 07743 Jena

Tel.: +49 (0)3641 52050, Fax: +49 (0)3641 5205111

0,8 Km to Campus

Pension "Belle Epoque"

Humboldtstraße 24, 07743 Jena

Tel.: +49 (0)3641 460015, Fax: +49 (0)3641 460030

1,1 Km to Campus

Hotelpension u. Sauna "Ausspanne zum Graf"

Schulstraße 23, 07778 Dornburg-Camburg

Tel.: +49(0)36427 22581, Fax: +49 (0)36427 70955

1,5 Km to Campus

Pension Katzschmann

Hügelstraße 8, 07749 Jena

Tel.: +49 (0)3641 396720, Fax: +49 (0)3641 380019

1,7 Km to Campus

Pension und Gaststätte Adria Grill

Wenigenjenaer Ufer 15, 07749 Jena

Tel.: +49 (0)3641 445572, Fax: +49 (0)3641 890050

2,5 Km to Campus

Pension FB

Rheinlandstraße 8, 07743 Jena

Tel.: +49 (0)3641 425885, Fax: +49 (0)3641 5205111

2,9 Km to Campus

Gasthof Deutsche Eiche

Bürgelsche Straße 33, 07751 Jena

Tel.: +49 (0)3641 228678, Fax: +49 (0)3641 228679

6,5 Km to Campus

Directions



■ Conference venue

Friedrich Schiller University Jena
Carl-Zeiss-Straße 3
07743 Jena

Nothing could be simpler! After all, Jena is in the centre of Germany, giving it very good infrastructural connections in all directions. Whether you come by air, rail or car, you can conveniently take short trips, for example to Berlin (about 270 km away), Dresden (about 170 km) and Leipzig.

By car

The north-south and east-west thoroughfares of the A9 Rostock-Munich and A4 Dresden-Eisenach-Frankfurt am Main motorways meet near Jena. Jena itself has three city connections to the A4 Dresden-Eisenach-Frankfurt am Main via the Jena-Zentrum and Jena-Göschwitz junctions. The A9 Berlin-Nuremberg can be accessed via the nearby Hermsdorfer Kreuz junction.

By plane

The closest airport is near Erfurt, the state capital of Thuringia, just 70 km away from Jena. The connection via the A4 means it takes 45 minutes to get there by car. It is only another 5 km to the Leipzig-Altenburg airport, and the Leipzig-Halle airport can also be reached in just an hour by car via the A9.

By rail

The rail network connects Jena to all European capitals and major cities. The intercity from Munich to Berlin and the interregional Chemnitz-Kassel-Dortmund-Aachen train stop in Jena.

- ICE (intercity express) connection, Hamburg-Berlin-Munich: Jena-Paradies
- Dresden-Erfurt-Frankfurt regional transport: West-Bahnhof

■ Gala concert/city walk

Auditorium of the Friedrich Schiller University Jena
Schloßgasse 1
07743 Jena

By foot

From the conference building (Carl-Zeiss-Str. 3/ city centre) it is only a few minute walk to the gala concert and the start of the city walk (Schloßgasse 1; at the University main building). If you want to use public transport take tram No 1, 4 or 34 from the city centre (direction „Zwätzen“) and get off at the stop „Universität“. Following Saalstraße you will then reach Schloßgasse.

■ Planetarium

ZEISS-PLANETARIUM JENA
Am Planetarium 5
07743 Jena

By car

A4 exit Lobeda:

Turn left into B88 („Stadtrodaer Straße“) and follow the road for about 7 km ■ turn left into B7 („Lutherplatz“) ■ turn right at „Bibliotheksplatz“ ■ then straight ahead until you reach the Planetarium

A4 exit Göschwitz:

Turn left into „Unter der Kirche“ ■ follow the road on „Rudolstädter Straße“ and „Kahlaische Straße“ ■ at the roundabout take the first exit on „Knebelstraße“ ■ then straight ahead on B88 ■ turn left into B7 („Lutherplatz“) ■ turn right at „Bibliotheksplatz“ ■ then straight ahead until you reach the Planetarium

From direction Weimar:

B7 direction Jena ■ turn right at „Bibliotheksplatz“ ■ then straight ahead until you reach the Planetarium

From direction Naumburg:

B88 direction Jena ■ turn right into „Käthe-Kollwitz-Straße“ ■ left into Am Planetarium

From direction Eisenberg:

B7 direction Jena ■ turn right at „Bibliotheksplatz“ ■ then straight ahead until you reach the Planetarium

By foot

The Planetarium is at 15-20 min walking distance from the Friedrich Schiller University Jena (Carl-Zeiss-Strasse/city centre).

Head north on Carl-Zeiß-Straße toward Krautgasse, turn right onto Krautgasse and afterwards turn left onto Johannisplatz. Turn right onto Fürstengraben/B7 and then turn left onto Bibliotheksplatz. Continue onto Am Planetarium, destination will be on the left.

Map of the Area



- 1** Friedrich Schiller University Jena
- 2** ZEISS-PLANETARIUM
- 3** Auditorium of the Friedrich Schiller University Jena
- H** bus and tram stop

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Friedrich-Schiller-University Jena


**ILMENAU UNIVERSITY OF
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Track Title Overview

- A** Training and Further Education
- B** Imaging and Image Processing
- C** Image Based Intervention
- D** Biomaterials and Biocompatibility
- E** Biosensors and Bioanalytics
- F** Biosignal Processing
- G** Cellular-, Tissue- und Bioengineering
- H** Surgical Technique and Endoscopy
- I** Clinical Engineering
- J** Ergonomics and Risk Management
- K** Home health care and AAL
- L** Clinical and Ambulatory Monitoring
- M** Magnetic Methods in Medicine
- N** Medical Information Systems, Telemedicine, eHealth, mHealth
- O** Modelling and Simulation
- P** Ophthalmology Techniques, Optical and Photonic Processes
- Q** Personalized Medical Technology
- R** Prevention and Rehabilitation Engineering
- S** Prosthetics and Implants
- Z** Special Sessions

DGBMT GERMAN SOCIETY FOR BIOMEDICAL
ENGINEERING WITHIN VDE

DGBMT within VDE
Stresemannallee 15
D - 60596 Frankfurt am Main
Tel.: +49 (0)69 6308-348
E-Mail: dgbmt@vde.com
www.vde.com/dgbmt