

5th Conference on PET/MR and SPECT/MR

May 23rd – 25th 2016

Maritim Hotel Cologne



Istituto Nazionale di Fisica Nucleare



Almost 200 scientists from all over the world from the fields of PET/MR and SPECT/MR hybrid systems, but also PET, SPECT and MR, are expected to meet at the **PSMR2016 - 5th Conference on "PET/MR and SPECT/MR"**. This is the fifth edition of an already established and successful international conference of PET-MR/SPECT-MR (2012 Elba Island-Italy, 2013 Aachen-Germany, 2014 Kos Island-Greece, and 2015 Elba Island-Italy) and we are proud to announce that in 2016 we are going to be back in Germany. This time in Cologne, the lively and cosmopolitan cathedral city at the Rhine River! The conference will take place in **May 23-25, 2016, at Maritim Hotel, Cologne, Germany.**

Forschungszentrum Jülich, Pisa University-INFN, the Technological Institute of Athens, and the COST Action FAST TD-1401 sponsor the organization of this conference, IEEE / TNS give technical support. The conference covers the technological aspects of both sequential and simultaneous PET/MR and SPECT/MR systems and their clinical and preclinical applications, but there is also space for dedicated systems, novel technologies and new tracers. Modern diagnostic techniques range from studying whole biological systems down to the molecular level, where multimodal imaging plays an ever more important role. The **PSMR2016** will provide ample of space for detailed discussion among the experts in the field of multimodal molecular imaging.

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Monday, 23 May 2016

08:00 Registration

09:20 Welcome & Opening Session - N. Jon Shah, Alberto Del Guerra, George Loudos

09:35 Invited talk

PET/MR: shedding light on brain physiology and pathology

Speaker: Alexander Drzezga (Klinik und Poliklinik für Nuklearmedizin, Universitätsklinikum Köln, Germany)

10:10 Session 1: Instrumentation I - Nicola Belcari (Pisa, Italy)

10:10 **Towards using large and thick monolithic scintillators with high DOI performance**

Speaker: Andrea Gonzalez-Montoro (i3M-CSIC, Detectors, Valencia, Spain)

10:30 **A New DOI PET Detector Concept for Linear Graded Silicon Photomultiplier in Hybrid MR/PET**

Speaker: Arne Berneking (Forschungszentrum Jülich, INM-4, Jülich, Germany)

10:50 **Performance evaluation of a second prototype PET-MRI system based on four-layer DOI-PET detectors integrated with a RF coil**

Speaker: Fumihiko Nishikido (National Institute of Radiological Sciences, Molecular imaging center, Chiba, Japan)

11:10 Coffee break

11:40 Session 2: Applications I - Jörg van den Hoff (Dresden, Germany)

11:40 **PET/MR and Epilepsy**

Speaker: Val Lowe (Mayo Clinic, Radiology, Rochester, NY, USA)

12:00 **Comparison of cerebral blood flow from standard- and multi-delay arterial spin labeling MRI with [15O]-water PET by simultaneous PET/MRI**

Speaker: Audrey Fan (Stanford University, Radiology, Stanford, CA, USA)

12:20 **Investigating dopamine synthesis capacity by the use of simultaneous [18 F]-FDOPA-PET/MRI**

Speaker: Jorge Cabello (Klinikum rechts der Isar, TUM, Nuclear medicine, Munich, Germany)

12:40 **The Halo-Artifact in 68Ga-PSMA-PET/MRI: Studies Using Phantom and Clinical Data**

Speaker: Thorsten Heußner (German Cancer Research Center, Medical Physics in Radiology, Heidelberg, Germany)

13:00 Lunch break

14:30 **Session 3: Software I - Jorge Cabello (Munich, Germany)**

14:30 **ZTE continuous attenuation correction in brain PET/MR: comparison to CT and atlas-based attenuation correction**

Speaker: Maya Khalifé (Commissariat à l'Energie Atomique et aux Energies Alternatives, Laboratoire Imagerie Moléculaire In Vivo IMIV, Orsay, France)

14:50 **Comparison of numerical algorithms for scatter-to-attenuation reconstruction in PET**

Speaker: Yannick Berker (University of Pennsylvania, Department of Radiology, Philadelphia, PA, USA)

15:10 **PET Reconstruction Using Anatomical MRI Information via Joint Total Variation**

Speaker: Georg Schramm (KU Leuven, Department of Imaging and Pathology, Division of Nuclear Medicine and Molecular Imaging, Leuven, Belgium)

15:30 **Effect of Zero-TE-based Attenuation correction Methods on PET Quantification of Head and Neck Lesions in PET/MRI**

Speaker: Keum Sil Lee (Stanford University, Radiology, Stanford, CA, USA)

15:50 **Blood-free modelling of PET tracers with metabolites using MRI-corrected whole-blood and a constrained simultaneous estimation approach**

Speaker: Hasan Sari (University College London, Institute of Nuclear Medicine, London, UK)

16:10 Coffee break

16:40 **Session 4: Preclinical Systems & Applications - Hidehiro Iida (Suita City, Japan)**

16:40 **A Custom RF Coil for High Resolution Rat PET/MR Imaging at 7T with a PET Insert**

Speaker: Andrew Goertzen (University of Manitoba, Department of Radiology, Winnipeg, Canada)

17:00 **Evaluation of a PET insert in a 7T MR, based on monolithic crystals and SiPMs**

Speaker: Antonio J. Gonzalez (i3M-CSIC, Detectors, Valencia, Spain)

17:20 **SAFIR: Evaluation of the Performance of ASICs at High Count Rate**

Speaker: Mikiko Ito (ETH Zurich, Institute of Particle Physics, Zurich, Switzerland)

17:40 **Non-Invasive Quantification of Cerebral Blood Flow by Hybrid MR/PET**

Speaker: Udunna Anazodo (Lawson Health Research Institute, Medical Imaging, London, Canada)

18:00 **Tracer kinetics in a canine model of cardiac infarction: Bolus injection versus constant infusion of 18F-FDG with simultaneous PET/MR**

Speaker: Benjamin Wilk (University of Western Ontario, Medical Biophysics, London, Canada)

Tuesday, 24 May 2016

09:00 **Invited talk**

Similarities and Difference between MRI-based Glucose Detection and FDG-PET

Speaker: Xavier Golay (UCL Institute of Neurology, National Hospital for Neurology & Neurosurgery, London, UK)

09:35 **Session 5: Instrumentation II - Volkmar Schulz (Aachen, Germany)**

09:35 **Assessment of PET performance of a 32-Channel MR Brain Array Head Coil Compatible with PET for Integrated PET-MRI**

Speaker: Udunna Anazodo (Lawson Health Research Institute, Medical Biophysics, London, Canada)

09:55 **A PET Device and Techniques for MRI Compatible Application**

Speaker: Keiji Shimizu (Hamamatsu Photonics K.K., Development Center, Hamamatsu, Japan)

10:15 **Evaluation of a data acquisition system for sparse readout of SiPM arrays with the TRIROC ASIC**

Speaker: Emanuele Zaccaro (Università di Pisa, Dipartimento di Fisica, Pisa, Italy)

10:35 Coffee break

11:10 Industrial Session - David Brasse (Strasbourg, France)

11:10 Bruker: **PET and High-Field MRI: New Opportunities based on Albira Si Technology**

Speaker: **Thomas Bruckbauer** (Bruker BioSpin MRI GmbH, Ettlingen, Germany)

11:40 Siemens:

12:10 RS²D **RS2D: from refurbished NMR to PET/MR**

Speaker: **Rémy Schimpf** (RS²D, Mundolsheim, France)

12:30 Mediso: **High performance preclinical PET/MRI - 3.0 update installed**

Speaker: **Sandor Hobor** (Preclinical Imaging, Mediso Ltd., Budapest, Hungary)

12:50 Lunch break

14:20 Poster Session I - Jens Maus (Dresden, Germany), Georg Schramm (Leuven, Belgium)

Bolus Infusion Scheme for [11C]Flumazenil to Provide Steady-State Tissue and Plasma Levels in Neuroreceptor/Activation Studies with PET/MR [ID=64]

Presenter: **Jörg Mauler** (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

Simultaneous Trimodal MR-PET-EEG Imaging Do EEG-caps generate artefacts in the PET images? [ID=18]

Presenter: **Ravichandran Rajkumar** (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

Improving the Timing Performance of a PET Employing Digital Silicon Photomultipliers [ID=69]

Presenter: **David Schug** (RWTH Aachen University, Dept. of Physics of Molecular Imaging Systems, Aachen, Germany)

The effect of metal implants on lesion assessment in simultaneous TOF PET/MR [ID=45]

Presenter: **Hanna Svirydenka** (University Hospital Zurich, Department of Nuclear Medicine, Zurich, Switzerland)

Small Animal PET Scanner for PET-MRI at Ultra-High Magnetic Fields [ID=72]

Presenter: **Nicola Bertolino** (SynchroPET Inc., Research, Stony Brook, NY, USA)

Inter-Crystal Scatter Rejection for Pixelated PET-Detectors [ID=9]

Presenter: **Christian Ritzer** (RWTH-Aachen, Dept. of Physics of Molecular Imaging Systems, Aachen, Germany)

Final design and first results of the MINDView brain PET insert [ID=49]

Presenter: **Antonio J. Gonzalez** (i3M-CSIC, Detectors, Valencia, Spain)

Influence of MR-safe Headsets on PET Attenuation in Combined PET-MRT Scans of the Brain [ID=44]

Presenter: **Florian Büther** (University Hospital of Münster, Department of Nuclear Medicine, Münster, Germany)

Evaluation of MR image-derived input function methods for quantification of glucose metabolism by integrated PET-MRI [ID=38]

Presenter: **Udunna Anazodo** (Western University, Medical Biophysics, London, Canada)

Regional Quantification in Multi-center Neurological PET/MR – an Intra-vendor Comparison Study [ID=35]

Presenter: **Jarmo Teuho** (University of Turku, Turku PET Centre, Turku, Finland)

PET-MR attenuation correction with a maximum probability method: low bias stable over time in dynamic acquisitions [ID=24]

Presenter: **Inés Mérida** (CERMEP, PET-MR, Lyon, France)

Automated brain PET/MRI processing with Docker containers [ID=27]

Presenter: **Benjamin Thomas** (Agency for Science Technology and Research-Nat. Univ. of Singapore, Clinical Imaging Research Centre, Singapore, Singapore)

Validation and application of PET-SORTEO for the geometry of the Siemens mMR scanner [ID=40]

Presenter: **Zacharie Irace** (CERMEP, LILI TEP-IRM, Bron, France)

Performance comparison between the dedicated TRIMAGE Brain PET/MR/EEG scanner and the whole body Biograph mMR scanner using GATE simulations [ID=55]

Presenter: **Jorge Cabello** (Klinikum rechts der Isar, TUM, Nuclear medicine, Munich, Germany)

Evaluation of PET quantification accuracy in-vivo using image derived arterial blood SUV: proof of concept [ID=33]

Presenter: **Frank Hofheinz** (Helmholtz-Zentrum Dresden-Rossendorf, PET-Center, Dresden, Germany)

15:50 Coffee break

16:20 Session 6: Emerging Applications - Hans Herzog (Jülich, Germany)

16:20 **Perspectives for hybrid MR-PET in multicenter dementia research and prevention trials**

Speaker: **Karl Herholz** (University of Manchester, IBBMH-WMIC, Manchester, UK)

16:40 **Multivariate hippocampal subfield analysis of PET, DTI and ASL in MCI and AD**

Speaker: **Audrey Fan** (Stanford University, Radiology, Stanford, CA, USA)

- 17:00 **Simultaneous trimodal imaging approach using [11C]-Flumazenil for MR-PET-EEG: feasibility of set-up**
Speaker: Irene Neuner (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)
- 17:20 **Altered Energetic Demand of Resting State Functional Connectivity in Frontotemporal Dementia**
Speaker: Esther Warnert (Western University, Clinical Neurological Sciences, London, Canada)
- 17:40 **Simultaneous water content, electrical conductivity and susceptibility mapping in meningiomas on a 3T MR-PET scanner**
Speaker: YuPeng Liao (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)
- 18:00 **Hyperpolarized 13C-MRSI and PET (hyperPET) in an osteomyelitis pig model: a pilot study**
Speaker: Sofie Rahbek (Rigshospitalet, Clinical Physiology, Nuclear Medicine and PET, Copenhagen, Denmark)
- 20:00 Conference Dinner

Wednesday, 25 May 2016

09:00 Invited talk

Challenges and Possibilities of Multinuclear MRI

Speaker: Armin Nagel, (Universitätsklinikum Erlangen, Radiologisches Institut, Erlangen, Germany)

09:35 Session 7: Software II - Brian Hutton (London, UK)

09:35 The use of a MR based respiratory motion model for optimal respiratory motion correction in PET/MR imaging

Speaker: Hadi Fayad (LaTIM, INSERM UMR1101, Faculty of Medicine, UBO, Brest, France)

09:55 Five-Dimensional Respiratory and Cardiac Motion Compensation for Simultaneous PET/MR

Speaker: Christopher M. Rank (German Cancer Research Center, Medical Physics in Radiology, Heidelberg, Germany)

10:15 Attenuation Maps from LSO Background Activity for PET/MR

Speaker: Christoph Lerche (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

10:35 Coffee break

11:00 Poster Session II - Florian Büther (Münster, Germany), Udunna Anazodo (London, Canada)

MRI-Based Motion Model for Correcting Physiological Motion in Dynamic PET/MRI Studies [ID=22]

Presenter: Mirco Heß (University of Münster, European Institute for Molecular Imaging – EIMI, Münster, Germany)

Preliminary results of a combined FET-PET and diffusion kurtosis imaging study of brain tumours [ID=62]

Presenter: Xiang Gao (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

Exploration of the concept of biased agonism: a serotonin 5-HT_{1A} PET-MR receptor study [ID=56]

Presenter: Nicolas Costes (CERMEP, MR-PET, Lyon, France)

Optimizing MR Angiography for Image-based Arterial Input Function Estimation in 15O-H₂O Study [ID=70]

Presenter: Audrey Fan (Stanford University, Radiology, Stanford, CA, USA)

Local transceiver MRI coil with TOF-PET tomograph functionality [ID=7]

Presenter: Glowacz Bartosz (Jagiellonian University, Physics, Astronomy and Applied Computer Science, Krakow, Poland)

Characterisation of a SiPM based dual-layer detector with real time pixel identification capability [ID=6]

Presenter: Matteo Morrocchi (Università di Pisa, Dipartimento di Fisica, Pisa, Italy)

Design and Characterization of a Frequency Selective RF Shield for PET Detector Modules in Hybrid MR/PET Imaging [ID=11]

Presenters: Arne Berneking (Forschungszentrum Jülich, INM-4, Jülich, Germany), Riccardo Trincherò (INFN, Sezione di Torino, Torino, Italy)

Development of an NMR probe to measure the eddy-current-induced magnetic field [ID=15]

Presenter: Nicolas Gross-Weege (RWTH Aachen University, Dept. of Physics of Molecular Imaging Systems, Aachen, Germany)

Towards the realization of a SiPM-based preclinical SPECT/MR system [ID=68]

Presenter: Michele Occhipinti (Politecnico di Milano, DEIB, Milano, Italy)

Effect of Craniotomy on MR-based Attenuation Correction on PET/MRI Quantification in Glioblastoma [ID=30]

Presenter: Keum Sil Lee (Stanford University, Radiology, Stanford, CA, USA)

Multimodal study of brain tumours: non-Gaussian diffusion and FET-PET [ID=28]

Presenter: Ganna Blazhenets (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

Imaging of Plants with MRI and the dedicated PET scanner phenoPET [ID=1]

Presenter: Matthias Streun (Forschungszentrum Juelich, Central Institute of Engineering, Electronics and Analytics-2, Juelich, Germany)

A Proposal for an Open Source Framework for Synergistic Image Reconstruction of PET-MR Data [ID=43]

Presenter: Kris Thielemans (University College London, Institute of Nuclear Medicine, London, UK)

- Effect of multiple tissue classes and continuous bone template in tissue probability-based attenuation correction for brain PET/MR** [ID=29]
Presenter: Jarmo Teuho (University of Turku, Turku PET Centre, Turku, Finland)
- Markerless Attenuation Correction for Flexible MRI RF Surface Coils in Hybrid PET/MRI** [ID=25]
Presenter: Lynn Johann Frohwein (University of Muenster, European Institute for Molecular Imaging, Muenster, Germany)
- Respiratory-Gated Motion Compensation in clinical PET/MR** [ID=8]
Presenter: Jens Maus (Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiopharmaceutical Cancer Research, Dresden, Germany)

12:30 Lunch break

14:00 Session 8: COST action TD1401-FAST – WG5

Time-of-Flight PET - Etienne Auffray Hillemanns (CERN, Genève, Switzerland)

14:00 **SensL J-Series SiPM for High-Performance Timing**

Speaker: John Murphy (SensL, Sales, Cork, Ireland)

14:20 **Development of DOI-TOF-PET Detectors for Brain PET/MR Imaging**

Speaker: Tianpeng Xu (Tsinghua University, Department of Engineering Physics, Beijing, China)

14:40 **Time efficient scatter correction in Time-Of-Flight PET image reconstruction**

Speaker: Pavel Nikulin (Helmholtz-Zentrum Dresden-Rossendorf, Institute of Radiopharmaceutical Cancer Research, Dresden, Germany)

15:00 **An EM-Algorithm for TOF-PET to Reconstruct the Activity and Attenuation Simultaneously**

Speaker: Salvo Koen (VUB, Nuclear Medicine, Brussels, Belgium)

15:20 **The COST action TD1401 - FAST: An overview**

Speaker: Pedro Almeida (Faculty of Science, University of Lisbon, Lisbon, Portugal)

15:32 **Advanced Time-of-Flight (ToF) PET scintillation photon detectors compatible with MR systems**

Speaker: Karl Ziemons (Aachen University of Applied Sciences, Medical Technology and Technomathematics, Jülich, Germany)

15:45 Coffee break

16:10 Session 9: Applications II, Chairperson: Karl Herholz

16:10 **Correlative imaging of FET PET, MRI and post mortem histology in progressive glioblastoma - a case report**

Speaker: Philipp Lohmann (Forschungszentrum Jülich, Institute of Neuroscience and Medicine-4, Jülich, Germany)

16:30 **Application of the MR-AC method RESOLUTE to oncology patients with skull surgery**

Speaker: Claes Ladefoged (Rigshospitalet, Clinical Physiology, Nuclear Medicine, and PET, Copenhagen, Denmark)

16:50 **Voxel-Wise Correlation of [18F]Fluorocholine, CSI, and ADC in Localized Prostate Cancer**

Speaker: Reggie Taylor (Lawson Health Research Institute, Imaging Program, London, Canada)

17:10 **Integrated Positron Emission Tomography/ Magnetic Resonance Imaging in the Treatment of Head and Neck Cancer: Preliminary Results**

Speaker: Benjamin Thomas (A*Star-NUS Clinical Imaging Research Centre, Diagnostic Radiology, Singapore, Singapore)

17:30 Closing Session, N. Jon Shah, Alberto Del Guerra, George Loudos

18:00 End of the Conference

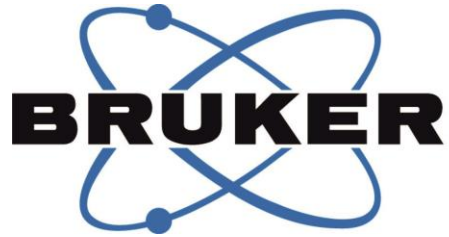
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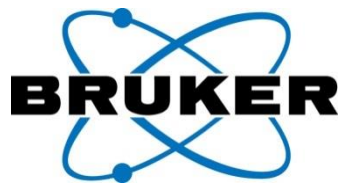
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