

# OVERVIEW – NFSI & ICBEM 2011

## Friday 13 May

08:50 – 12:30 **Plenary Session: Summit Room**

10:30 – 11:00 **Alpine Meadows:** Coffee Break -- Exhibits and Posters

12:30 – 14:00 **Glacier Salon:** Lunch provided for registered participants

### Parallel Sessions

14:00 – 17:15 | **Assiniboine:** Heart I | **Summit:** EEG I |

15:30 – 16:00 **Alpine Meadows:** Coffee Break -- Exhibits and Posters

16:00 – 17:15 | **Assiniboine:** Impedance Tomography | **Summit:** EEG II |

18:00 – 19:30 **Glacier Salon:** - Ice Breaker Reception

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## Saturday 14 May

08:50 – 12:30 **Plenary Session: Summit Room**

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### Parallel Sessions

14:00 – 17:15 | **Castle:** Modeling | **Assiniboine:** Cognition | **Summit:** MEG/EEG/ECG |

15:30 – 16:00 **Alpine:** Coffee Break: View Posters and Exhibits

16:00 – 17:15 | **Castle:** fMRI/Multimodal | **Assiniboine:** Tutorials | **Summit:** Heart II |

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## Sunday 15 May

08:50 – 12:30 **Plenary Session: Summit Room**

10:30 – 11:00 **Alpine Meadows:** Coffee Break -- Exhibits and Posters

12:30 – 12:45 Concluding Remarks, Scientific Sessions End

12:45 – 14:00 ISBEM and ISFSI Council Meetings

17:30 – 22:00 Gala BBQ and Dance - Brewster's MountView Barbecue, Bus departs from outside the lobby of the Banff Park Lodge (included for all registered participants and registered accompanying persons)

# SCIENTIFIC PROGRAM

## Friday 13 May – Plenary Session

### *Summit Room – Chairpersons: Zoltan Koles and Edward Vigmond*

- 08:50 – 09:00 Welcoming and Opening Remarks
- 09:00 – 09:45 Functional imaging of brain and cardiac electrical activity, *Bin He*
- 09:45 – 10:30 Image-based cardiac modeling: implications for ventricular ablation, cardiac resynchronization therapy and arrhythmia mechanisms, *Natalia Trayanova*
- 10:30 – 11:00 Coffee Break - Alpine Meadows – Exhibits and Poster Session**
- 11:00 – 11:45 Merging Cardiac MRI, ECG/BSPM and catheter biosignals for better diagnosis and therapy planning, *Olaf Dössel*
- 11:45 – 12:30 Functional brain imaging using MREIT and EIT: requirements and feasibility, *Eung Je Woo*
- 12:30 – 14:00 Lunch Provided in the Glacier Salon; View Posters and Exhibits in the Alpine**

## Friday 13 May – Parallel Sessions

### *Summit Room: EEG I – Chairperson: Jari Hyttinen*

- 14:00 – 14:15 Stochastic Behavior of Phase Synchronization Mapped with Seizure-Free 256-Channel Scalp EEG, *Ceon Ramon, USA*
- 14:15 – 14:30 Estimation of Cortical Dipole Distributions for Multiple Signal Sources Based on ICA, *Junichi Hori, JAPAN*
- 14:30 – 14:45 Adaptive Spatial Harmonic Analysis of EEG Data Using Laplacian Eigenspace, *Uwe Graichen, GERMANY*
- 14:45 – 15:00 Evaluating Empirical Bayesian Source Estimation with Dense Array EEG, *J. Song, USA*
- 15:00 – 15:15 EEG Surface Laplacian Using Realistic Head Geometry, *Siyi Deng, USA*
- 15:15 – 15:30 Scalp EEG Reference: From Empirical Choice To Evidence Based Zero Reference, *Dezhong Yao, CHINA*

**Assiniboine Room: Heart I – Chairperson: Edward Vigmond and Olaf Dössel**

- 14:00 – 14:15      Localization of the Origin of Premature Beats Using an Integral Method, *Olaf Dössel*, GERMANY
- 14:15 – 14:30      \*A Recursive Cellular Automaton that Reconstructs Transmembrane Voltages with a Range-Adjusted Tikhonov-Method, *Walther H. W. Schulze*, GERMANY
- 14:30 – 14:45      \*A Convex Relaxation Framework for Initialization of Activation-Based Inverse Electrocardiography, *Burak Erem*, USA
- 14:45 – 15:00      \*Estimation of Activation Sequence from Time Course of Equivalent Current Density in Pathological Hearts - A Simulation Study, *Zhaoye Zhou*, USA
- 15:00 – 15:15      \*Assessing Catheter Contact in Radiofrequency Cardiac Ablation Using Complex Impedance , *Neal P. Gallagher*, CANADA
- 15:15 – 15:30      Safety Factor in Cardiac Propagation, *Edward Vigmond*, CANADA

**15:30 – 16:00      Coffee Break - Alpine Meadows – Exhibits and Poster Session**

**Summit Room: EEG II – Chairperson: Ceon Ramon**

- 16:00 – 16:15      \*Investigating the Measurement Capability of Densely-Distributed Subdermal EEG Electrodes, *Narayan Puthanmadam Subramaniam*, FINLAND
- 16:15 – 16:30      Recording Cortical EEG Subcortically – Improved EEG Monitoring from Depth-Stimulation Electrodes, *Katrina Wendel*, FINLAND
- 16:30 – 16:45      \*Epileptic Brain Network from Scalp EEG: Identifying the Epileptic Driver by Connectivity Analysis on Brain Waveforms, *Pieter van Mierlo*, BELGIUM
- 16:45 – 17:00      \*Sparse Representation of EEG Signals for Motor Imagery Based BCI Classification, *Younghak Shin*, REPUBLIC OF KOREA
- 17:00 – 17:15      Device for Recording the EEG in Emergency Medicine using existing ECG Infrastructure, *Jari A. Hyttinen*, FINLAND

**Assiniboine Room: Impedance Tomography – Chairperson: Eung Je Woo**

- 16:00 – 16:15      \*In Vivo MREIT Conductivity Imaging of Canine Brain to Evaluate Ischemia and Abscess, *Young Tae Kim*, KOREA
- 16:15 – 16:30      \*Conductivity Imaging of Human Lower Extremity using MREIT with Multi-echo Pulse Sequence and 3 mA Imaging Current, *Young Tae Kim*, KOREA
- 16:30 – 16:45      Feasibility of Dual-frequency Conductivity Imaging using MREIT and MREPT, *Atul S. Minhas*, SOUTH KOREA
- 16:45 – 17:00      Three-dimensional MREIT Simulator (MREITSim), *Atul S. Minhas*, SOUTH KOREA
- 17:00 – 17:15      \*Numerical Simulation of Frequency-Difference EIT Using Multi-shell Concentric Spherical Head Model, *Sujin Ahn*, KOREA

**18:00 – 19:30      Ice Breaker Reception – Glacier Salon**

## Saturday 14 May – Plenary Session

### *Summit Room – Chairperson: Bin He*

- 08:50 – 09:00      Opening Remarks
- 09:00 – 09:45      Non-invasive localization of the epileptic focus with EEG-fMRI, *Jean Gotman*
- 09:45 – 10:30      Hyperexcitable 'epilepsy' networks explored by EEG – fMRI, *Graeme Jackson*
- 10:30 – 11:00      Coffee Break – Alpine Meadows - Exhibits and Poster Session**
- 11:00 – 11:45      From phantoms to humans: development of intracranial EEG-fMRI, *Paolo Federico*
- 11:45 – 12:30      Combining EEG Mapping and fMRI to reveal cerebral network dynamics, *Christoph Michel*
- 12:30 – 14:00      Lunch Provided in the Glacier Salon; View Posters and Exhibits in the Alpine**

## Saturday 14 May – Parallel Sessions

### *Summit Room: MEG/EEG/ECG – Chairperson: Christoph Michel*

- 14:00 – 14:15      A Method for ECG T-Wave Alternans Detection Based on Segmented Phase-Curve Distance, *Kazuo Yana, JAPAN*
- 14:15 – 14:30      \*Identifying Myocardial Ischemia by Inversely Computing Transmembrane Potentials from Body-Surface Potential Maps, *Dafang Wang, USA*
- 14:30 – 14:45      \*Cortical Functional Connectivity Inference Using MEG  
*Siddharth Rajaram, USA*
- 14:45 – 15:00      EEG-Based Discrimination of Imagined Speech Phonemes  
*Xuemin Chi, US*
- 15:00 – 15:15      \*Effect of Skull Discontinuities on MEG and EEG: Experimental Results,  
*Stephan Lau, GERMANY and AUSTRALIA*
- 15:15 – 15:30      MEG-Based Brain Functional Connectivity Analysis Using eConnectome  
*Yakang Dai, USA*

**Assiniboine Room: Cognition – Chairperson: Katarzyna Blinowska**

- 14:00 – 14:15 \*Spatial Attention Enhances Steady-State Visual Evoked Responses in the Gamma Band, *Samuel Thorpe*, USA
- 14:15 – 14:30 \*Non-native Homonym Processing: an ERP Measurement  
*Jiehui Hu*, CHINA
- 14:30 – 14:45 Involuntary Processing of Timbre: A Mismatch Negativity Study  
*Yongxiu Lai*, CHINA
- 14:45 – 15:00 \*EEG Reveals Divergent Paths for Speech Envelopes During Selective Attention, *Cort Horton*, USA
- 15:00 – 15:15 Methods for the EEG Hyperscanning. Simultaneous Recordings from Multiple Subjects during Social Interaction, *L. Astolfi*, ITALY
- 15:15 – 15:30 Time Varying Patterns of Directed Connectivity During Transitive Reasoning Tasks, *Maciej Kaminski*, POLAND

**Castle Room: Modelling – Chairpersons: Ceon Ramon and Geertjan Huiskamp**

- 14:00 – 14:15 Effect of Dura Layer on Scalp EEG Simulations, *Ceon Ramon*, USA
- 14:15 – 14:30 An Evaluation of Single Dipole Solutions to Extended Sources in EEG and MEG, *Geertjan Huiskamp*, THE NETHERLANDS
- 14:30 – 14:45 \*MEG/EEG Source Reconstruction Based on Gabor Thresholding in the Source Space, *Daniel Strohmeier*, GERMANY
- 14:45 – 15:00 On the accuracy of collocation and Galerkin BEM in the EEG/MEG forward problem, *Matti Stenroos*, FINLAND
- 15:00 – 15:15 \*How Reducing Model Mismatch is Beneficial to EEG Source Localization? – A Simulation Study, *Jun Hee Hong*, SOUTH KOREA
- 15:15 – 15:30 Volterra-Hansen Theory of Event-Related Transients Modulated by Inter-Event Intervals, *Mark E. Pflieger*, USA

**15:30 – 16:00 Coffee Break – Alpine Meadows - Exhibits and Poster Session**

**Summit Room: Heart II – Chairperson: Youssef Belhamadia**

- 16:00 – 16:15 The Influence of Open-Loop Currents on Bioelectric and Biomagnetic Measurements: A Phantom Study , *Jens Haueisen*, GERMANY
- 16:15 – 16:30 Cardiac Conductivity Values — A Challenge for Experimentalists?  
*Peter R. Johnston*, AUSTRALIA
- 16:30 – 16:45 A Novel Cardiac Equivalent Moving Dipole Solution  
*Shiqin Jiang*, CHINA
- 16:45 – 17:00 \*Model-Based Investigation of Transmural Gradients in Activation Rate During Ventricular Fibrillation, *Patrick M. Boyle*, CANADA
- 17:00 – 17:15 Spatiotemporal Cardiac Activation Sites Localization Using ECG Precordial Leads, *Ubaldo Robles*, USA
- 17:15 – 17:30 \*Numerical Computations of Cardiac AP using Level Set Based Geometries,  
*Myriam Rioux*, CANADA
- 17:30 – 17:45 Magnetic vs Sphygmomanometry Cardiac Pressure,  
*T. Cordova*, MÉXICO

**Assiniboine Room: Tutorials – Chairperson: TBA**

- 16:00 – 16:45 EEG data correction for EEG data recorded in the MR environment,  
*Patrick Britz*, Brainvision, USA
- 16:45 – 17:30 eConnectome for EEG/ECOG source imaging and connectivity mapping,  
*Yakang Dai*, University of Minnesota, USA

**Castle Room: fMRI/Multimodal – Chairperson: Paolo Federico**

- 16:00 – 16:15 Emotion-Attention Interactions in Adolescents with Depression and Anxiety: A Combined ERP and fMRI Investigation, *Andrea Shafer*, CANADA
- 16:15 – 16:30 \*Altered Intrinsic Functional Organization of the Brain in Idiopathic Generalized Epilepsy, *Cheng Luo*, CHINA
- 16:30 – 16:45 \*Imaging Epileptic Networks Using Spatial-Temporal EEG-fMRI Fusion, *Xu Lei*, CHINA
- 16:45 – 17:00 Neural Mechanisms of the Effect of External Auditory Pacemaker on Stuttering Speakers, *Akira Toyomura*, JAPAN
- 17:00 – 17:15 \*Gaussian Mixture Models for Brain Activation Detection from fMRI Data, *Gaurav Garg*, UNITED KINGDOM
- 17:15 – 17:30 \*A Coupled Model to Jointly Predict EEG and Optical Evoked Response Changes in Rats under Varying Stimulus Patterns, *Srinivas Laxminarayan*, USA
- 17:30 – 17:45 ESI and fMRI of Interictal and Ictal Epileptic Discharges, *Simon Vogrin and Stephan Lau*, AUSTRALIA



## Sunday 15 May – Plenary Session

### **Summit Room – Chairperson: Jens Haueisen**

- 08:50 – 09:00    Opening Remarks
- 09:00 – 09:45    MEG and fMRI as probes of cognitive function: Multimodal imaging of language perception and production, *Riitta Salmelin*
- 09:45 – 10:30    Current Directions in Dense Array EEG Source Localization  
*Don M. Tucker and Phan Luu, USA*
- 10:30 – 11:00    Coffee Break – Alpine Meadows – Exhibits and Poster Session**
- 11:00 – 11:45    Illuminating Brain Function: Functional near-infrared spectroscopy of cognitive dynamics, *Gabriele Gratton*
- 11:45 – 12:30    Functional source imaging of spinal cord activity from its evoked magnetic field, *Kensuke Sekihara*
- 12:30 – 12:45    Concluding Remarks, Scientific Sessions End
- 12:45 – 14:00    ISBEM and ISFSI Council Meetings

### **Afternoon free to network with colleagues and explore Banff**

- 17:30 – 22:00    Gala BBQ and Dance - Brewster's MountView Barbecue  
Bus departs from outside the lobby of the Banff Park Lodge (included for all registered participants and registered accompanying persons)**

## Friday 13 May – Posters

### *Alpine Meadows Reception Area:*

1. \*Nested Implicit Runge-Kutta Method for Simulating Cardiac Cell Models  
Justin Grenier and Youssef Belhamadia  
University of Alberta, Campus Saint-Jean, Edmonton, Alberta, Canada
2. Measuring Gastroesophageal Region Frequencies: Preliminary Results  
E. Hernández-Torres<sup>a</sup>, T. Cordova<sup>a</sup>, H. Pérez<sup>a</sup>, M. Sosa<sup>a</sup>, O. Reynoso-Orozco<sup>c</sup>, M.E. Cano<sup>c</sup> and A. Mendosa<sup>c</sup>  
<sup>a</sup>Dept. Physics & Engineering, University of Guanajuato campus León, GTO, México  
<sup>b</sup>Centro Universitario de la Ciénega, Universidad de Guadalajara, México  
<sup>c</sup>UMAE, Clínica T1-León, Instituto Mexicano del Seguro Social, GTO, México
3. \*Differences in Brain Structures Between Female Musicians and Non-Musicians  
Jianfu Li, Yongxiu Lai, Cheng Luo, Lan Yao, Dezhong Yao  
Key Laboratory for NeuroInformation, Ministry of Education, School of Life Science and Technology, University of Electronic Science and Technology of China, UESTC, Chengdu, China
4. \*Influence of Skull Inhomogeneities on EEG Source Localization  
Victoria Montes<sup>1</sup>, Hans Hallez<sup>1</sup> and Steven Staelens<sup>1,2</sup>  
<sup>1</sup>Medical Image and Signal Processing, Faculty of Engineering, Ghent University–IBBT, Ghent, Belgium  
<sup>2</sup>Molecular Imaging Center Antwerp, Faculty of Medicine, Antwerp University, Antwerp, Belgium
5. \*Comparison of Figures of Merits in Linear Inverse Problems  
Bojana Petkovic<sup>a</sup>, Roland Eichardt<sup>a,b</sup>, Daniel Baumgarten<sup>a,b</sup>, Uwe Graichen<sup>a</sup>, Jens Haueisen<sup>a,b</sup> and Luca Di Rienzo<sup>c</sup>  
<sup>a</sup>Institute of Biomedical Engineering and Informatics, Ilmenau University of Technology, Ilmenau, Germany  
<sup>b</sup>Biomagnetic Center, Clinic for Neurology, University Hospital Jena, Jena, Germany  
<sup>c</sup>Politecnico di Milano, Dipartimento di Elettrotecnica, Milano, Italy
6. Efficient Identification of Oblique Volterra Systems  
Mark E. Pflieger  
*Source Signal Imaging, Inc., San Diego, USA*
7. Effectiveness of Sparse Bayesian Algorithm for MVAR Coefficient Estimation in MEG/EEG Source-Space Causality Analysis  
Kensuke Sekihara<sup>1</sup>, Hagai Attias<sup>2</sup>, Julia Owen<sup>2</sup> and Srikantan S. Nagarajan<sup>3</sup>

<sup>1</sup>Tokyo Metropolitan University, Tokyo, Japan

<sup>2</sup>Golden Metallic Inc., San Francisco, CA, USA

<sup>3</sup>University of California, San Francisco, CA, USA

8. \*Neural Mechanisms Underlying the Immediate and Delayed Impact of Emotion on Cognition:  
A Functional Magnetic Resonance Imaging Investigation  
A.T. Shafer<sup>1</sup>, D. LaFreniere<sup>2</sup> and F. Dolcos<sup>1,3</sup>  
<sup>1</sup>Centre for Neuroscience, University of Alberta  
<sup>2</sup>Department of Psychology, University of Alberta  
<sup>3</sup>Department of Psychology, Neuroscience Program, and Beckman Institute,  
University of Illinois at Urbana - Champaign
  
9. \*Scalp Thickness Adjustment of Laplacian Estimates of Cortical Potential  
William Winter<sup>a</sup>, Siyi Deng<sup>b</sup>, Ramesh Srinivasan<sup>a,b</sup>  
<sup>a</sup>Dept. of Biomedical Engineering, University of California Irvine, Irvine, USA  
<sup>b</sup>Dept. of Cognitive Science, University of California Irvine, Irvine, USA
  
10. \*The Relationship between Conductivity Uncertainties and EEG Source Localization Accuracy  
Huishi Zhang, Lin Yang and Bin He  
Department of Biomedical Engineering, University of Minnesota, Minneapolis, USA

## Saturday 14 May – Posters

### *Alpine Meadows Reception Area:*

1. Magnetoencephalographic Study of Crossmodal Prediction and Association of Sensory Information  
Atsushi Aoyama and Shinya Kuriki, Research Center for Advanced Technologies, Tokyo Denki University, 2-1200, Inzai, Chiba, Japan
2. Automatic Generation of High-Resolution Anisotropic FE Models for EEG/MEG Source Reconstruction  
Daniel Güllmar<sup>a</sup>, Christoph Dinh<sup>a,b</sup>, Jens Haueisen<sup>b</sup> and Jürgen R. Reichenbach<sup>a</sup>  
<sup>a</sup>Medical Physics Group, IDIR I, Jena University Hospital, Jena, GERMANY  
<sup>b</sup>Institute of Biomedical Engineering and Informatics, Technical University, Ilmenau, Germany
3. \*Feasibility of High-Resolution MREIT With Less Than 1 mm Pixel Size  
Young Tae Kim, Atul S. Minhas, Zi Jun Meng, Hyung Joong Kim, and Eung Je Woo  
Department of Biomedical Engineering, Kyung Hee University, Gyeonggi-do, Korea
4. MEG Study of Music Processing in Bimusicals  
R. Matsunaga<sup>a, b</sup>, K. Yokosawa<sup>b</sup>, J. Abe<sup>a</sup>  
<sup>a</sup>Department of Psychology, Hokkaido University, Sapporo, Japan  
<sup>b</sup>Faculty of Human Sciences, Hokkaido University, Sapporo, Japan
5. Feasibility of Low Injection Current MREIT Using Less Than 1 mA  
Atul S. Minhas, Young Tae Kim, Zi Jun Meng, Hyung Joong Kim, and Eung Je Woo  
Department of Biomedical Engineering, Kyung Hee University, Yongin, Korea
6. An fMRI Study of the Brain Area that Involves Suppression of Mental Imagery Generation  
H. Motoyama and S. Hishitani  
Department of Psychology, Hokkaido University, Sapporo, Japan
7. \*Comparing coherence and phase-locking value as measures of functional connectivity  
Siddharth Rajaram<sup>1</sup>, Hari Bharadwaj<sup>1</sup>, Barbara G. Shinn-Cunningham<sup>1</sup>, Adrian KC Lee<sup>2</sup>  
<sup>1</sup>Boston University, Boston, MA, USA  
<sup>2</sup>University of Washington, Seattle, WA, USA
8. \*Comparison of fMRI Activation and EEG Source Localization using Beamformers During Motor Response in the Stroop Task: Preliminary Results  
Gregor Strobbe<sup>1</sup>, Seppe Santens<sup>2</sup>, Pieter Van Mierlo<sup>1</sup>, Hans Hallez<sup>1</sup>, Filip Van Opstal<sup>2</sup>, Yves Rosseel<sup>3</sup>,

Tom Verguts<sup>2</sup>, Stefaan Vandenberghe<sup>1</sup>

<sup>1</sup>Dept of Electronics and Informations Systems, Ghent University, Ghent, Belgium,

<sup>2</sup>Dept of Experimental Psychology, Ghent University, Ghent, Belgium

<sup>3</sup>Dept of Data Analysis, Ghent University, Ghent, Belgium

9. \*A Method to Remove MRI Artifact from Continuous EEG Based on the Combination of FASTR and ARX

ZhenYu Wang, Peng Xu, TieJun Liu, Xu Lei and Dezhong Yao

Key Laboratory for NeuroInformation, Ministry of Education, School of Life Science and Technology, University of Electronic Science and Technology of China, UESTC, Chengdu, China

10. \*Listen to the Song of the Brain in Real Time: The Chengdu Brainwave Music

Dan Wu, Xun Shi, Jun Hu, Xu Lei, Tiejun Liu and De-Zhong Yao

Key Laboratory for NeuroInformation, Ministry of Education, School of Life Science and Technology, University of Electronic Science and Technology of China, Chengdu, China

11. \*Measurement of Brain Activity Related to Conceptual Recognition during Sensory and Semantic Tasks

Kenichi Yuasa<sup>1,2</sup>, Atsushi Aoyama<sup>2,3</sup>, Kaoru Amano<sup>1</sup>, Satoshi Honda<sup>2</sup> and Tsunehiro Takeda<sup>1</sup>

<sup>1</sup>Graduate School of Frontier Science, The University of Tokyo, Kashiwa, Chiba, Japan

<sup>2</sup>Graduate School of Science and Technology, Keio University, Yokohama, Kanagawa, Japan

<sup>3</sup>ResearchCenter for Advanced Technologies, Tokyo Denki University, Inzai, Chiba, Japan