



2015
BURGUNDY
NEUROMEETING

21-24
january



24th ANT Burgundy Neurometing

Scientific Program

January 21 - 24, 2015 | Beaune, Burgundy - France



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Meeting Overview

	Morning	Afternoon	Evening
Wed Jan 21	Arrival	14:00 - 18:00 Hands-on workshop on multi-pin dry electrodes (ANDREA project)	19:00 - 20:30 Wine tasting 20:30 Welcome dinner
Thu Jan 22	9:00 - 13:15 Neuromodulation symposium Chaired by Dr. Jonathan Downar Keynote talk Prof. Dr. Walter Paulus A discussion on transcranial electrical stimulation techniques for targeted modulation of cortical plasticity	15:30 - 18:00 Sports and movement neuroscience symposium Chaired by Prof.Dr. Andreas Daffertshofer	19:00 - 20:30 Wine tasting 20:30 Dinner
	9:00-10:30 Workshop 1: Doing ecologically valid research in sports- and movement sciences By Martijn Schreuder, Bram van de Laar	11:00 - 13:00 Workshop 2: Getting down and dirty with asa By Martijn Schreuder, Bram van de Laar, Will Cuthbert	
		15:30 - 17:00 Workshop 3: TMS Neuronavigation and EMG motor mapping with visor2 By Sebastian Carstens	
Fri Jan 23	9:00 - 13:00 Neuroscience symposium Chaired by Dr. John J. Foxe Keynote talk Prof. David Liley Simultaneous EEG and MEG in non-lesional epilepsy and anaesthesia	15:00 - 18:20 Neurology, psychiatry and psychology symposium Chaired by Dr. Stefan Rampp	20:30 Gala dinner
	9:00-10:30 Open questions & answers session By Martijn Schreuder, Bram van de Laar, Sebastian Carstens and Will Cuthbert	11:00 - 13:00 Workshop 1: Combined TMS and EEG experiments with visor2 By Sebastian Carstens & Bram van de Laar	
		15:00 - 17:00 Workshop 2: Real-time analysis and visualization of EEG. By Bram van de Laar and Martijn Schreuder	
Sat Jan 24	9:00 - 12:00 Free communication symposium Chaired by Dr. Thomas Knösche	Departure	
	9:00 - 10:30 Open questions & answers session By Bram van de Laar, Martijn Schreuder, Sebastian Carstens and Will Cuthbert		

Wednesday Afternoon

Hands-on workshop on multi-pin dry electrodes

The workshop is organized within the framework of the Transfer of knowledge activities foreseen in the ANDREA project (www.andreaproject.eu/) - an EU funded ongoing activity dedicated to the development "Active Nanocoated Dry-electrode for EEG Applications". During the workshop a variety of applications areas will be discussed to learn how the novel multi-pin dry electrodes can be used in today's research. A few examples from previous EEG / ERP and BCI studies will be presented. Additionally, the participants will be invited to use the cap by themselves in a few small experiments and gain first-hand experience with this new technology. There will be time dedicated for discussions about signal quality and artifact correction, and participants will be given the opportunity to learn from the experts that developed the multi-pin dry electrodes.

The workshop relates to those interested in gel-free EEG, especially in BCI, medical and non-medical application areas. The demonstration and discussion will enable participants to evaluate the benefits of dry electrodes, their limitations, novel concepts for determination and elimination of artifacts, and to gain practical experience for possible future own applications of this new sensor technology.

Program:

- Short presentation about the ANDREA project and the process of developing the multi-pin electrodes
- Features
- Multi-pin dry electrodes in use: Studies and application cases
- Hands-on experiments
- Discussion questions & answers.

Presenters:

- Silvia Comani, University "G. d'Annunzio" of Chieti-Pescara, Chieti, Italy
- Jens Haueisen, Ilmenau University of Technology, Ilmenau, Germany
- Carlos Fonseca, University of Porto, Porto, Portugal
- Frank Zanow, eemagine GmbH, Berlin, Germany

19:00 Wine tasting in the foyer of Hotel Le Panorama

20:30 Welcome dinner in the restaurant of Hotel Le Panorama

Thursday Morning

Neuromodulation symposium

Symposium chair: **Dr. Jonathan Downar**

9:00 - 9:30 **Introduction by Jonathan Downar**

9:30 - 10:30 **Keynote talk by Walter Paulus**

A discussion on transcranial electrical stimulation techniques for targeted modulation of cortical plasticity

10:30 - 10:45 Coffee break

Mini theme - clinical applications of neuromodulation

10:45 - 11:05 **Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS)** Jean-Pascal Lefaucheur, Université Paris-Est-Créteil, France

11:05 - 11:25 **Accelerated HF-rTMS in treatment-resistant major depression: the key role of the subgenual Cingulate Cortex** Chris Baeken, Gent University, Belgium

11:25 - 11:45 **rTMS as an alternative therapy for central (neuropathic) pain: Clinical experience and long-term follow-up.** Roland Peyron, CHU de Saint-Etienne, Saint Etienne, France

11:45 - 12:05 **Deep Brain Stimulation of the Reward System for Treatment Resistant Depression** Volker Coenen, University Medical Center Freiburg, Germany

12:05 - 12:15 Coffee break

Mini theme - current issues: inter-individual variability of neuromodulation effects

12:15 - 12:35 **Interindividual variability of plasticity induced by paired associative stimulation** Ulf Ziemann, The Werner Reichardt Centre for Neuroscience, Tuebingen, Germany

12:35 - 12:55 **TMS and TDCS plasticity protocols: the importance of current direction** John Rothwell, UCL Institute of Neurology, London, UK

12:55 - 13:15 **Cortical circuits activated and modulated by transcranial stimulation techniques** Vincenzo Di Lazzaro, Campus Bio-Medico University of Rome, Italy

13:30 - 15:30 Lunch at hotel Le Panorama

Keynote talk by Prof. Dr. Walter Paulus

A discussion on transcranial electrical stimulation techniques for targeted modulation of cortical plasticity

Transcranial electric stimulation techniques have been developed as cheap and efficient tools for modifying cortical plasticity. Repetitive transcranial magnetic stimulation (rTMS) allows increasing or decreasing the excitability of corticospinal or cortico-cortical pathways depending on the intensity and frequency of short stimulation pulses in the range of 100 μ s. Here magnetic stimulation is the vehicle which allows transferring transcranially short-pulsed electric energy without inducing skin pain. Direct transcranial electric stimulation of the human brain can be used painlessly if less steep voltage gradients are involved. Weak transcranial direct current stimulation (tDCS) with a homogenous DC field fulfills this requirement ideally (Nitsche and Paulus, 2000). TDCS induces plastic aftereffects via membrane polarization: cathodal stimulation hyperpolarizes, while anodal stimulation depolarizes the resting membrane potential, whereby the induced after-effects depend on polarity, duration and intensity of the stimulation. Transcranial alternating current (tACS) (Antal et al, 2008) and random noise stimulation (tRNS) intend to interfere with ongoing cortical oscillations (Terney et al., 2008). Using these techniques, we can induce and modify differently neuroplastic changes with different advantages and disadvantages of tDCS, tACS and tRNS. Plastic aftereffects need a minimal stimulation duration time and may reverse with too long stimulation. Whereas in the normal stimulation duration range of about 10 minutes tDCS allows for excitability increase and decrease, tACS and tRNS induce only excitability increases in particular with higher frequencies between 100 and 600 Hz or in the low kHz range. TACS and tRNS induce less skin sensation than tDCS and accordingly can be blinded better. They are also no longer current flow direction sensitive. These effects are strongly modified by neuropharmacological co-application: L-DOPA leads to a focusing effect in analogy to its otherwise found U-shaped dose dependency. Dopamine agonists may reverse anodal excitatory tDCS into inhibition, SSRI provide the opposite effect. In conclusion transcranial electrical stimulation techniques allow for targeted modulation of cortical plasticity in man.

Thursday Afternoon

Sports and movement neuroscience symposium

Session chair: Prof. Dr. Andreas Daffertshofer

15:30 - 16:00	Introduction talk by Andreas Daffertshofer
16:00 - 16:20	EEG spectral power and coherence during biathlon rifle shooting: A pilot study. Germano Gallicio, University of Salzburg, Austria
16:20 - 16:40	The multi-action plan (MAP) intervention model: assessment with elite driver Edson Filho, University of Chieti, Italy
16:40 - 17:00	Theta coherence reflects attentional focus and perceived effort in cycling Selenia di Fronso, University of Chieti, Italy
17:00 - 17:20	Coffee break
17:20 - 17:40	Investigating the neuronal processes of strategic interactions in real-life-situations: a case study Dietmar Henrich, Brandenburg University of Technology, Germany
17:40 - 18:00	EEG in sports - from artefacts to biomarkers Andreas Daffertshofer, VU University Amsterdam, The Netherlands

Thursday workshops

Workshop 1: Doing ecologically valid research in sports- and movement sciences.

By Bram van de Laar and Martijn Schreuder
Time: 9:00 – 10:30

Traditionally, EEG experiments were done in a shielded lab, with the subject moving as little as possible. As this is quite unnatural behavior, in recent years, this dogma has changed. EEG has to be taken 'out of the lab'. The family of **eego** amplifiers facilitate this new paradigm in neuroscience. With this development, one can think of various neuroscientific experiments involving sports, movement and realistic settings. Although the hardware is ready for this revolution, we are still faced with various practical issues when setting up these experiments and analyzing the data. This workshop will help you with avoiding these pitfalls and improve the results from your experiments.

Workshop 2: Getting down and dirty with asa

By Will Cuthbert, Bram van de Laar and Martijn Schreuder
Time: 11:00 – 13:00

This workshop will cover a wide spectrum of analysis techniques in asa. During the workshop you learn how to extract, analyze and interpret valuable data and maximize your research output. A great amount of time will be spent on explanation of features, answering user questions and sharing experiences. Our experts will guide you step-by-step through the process and address important aspects of data analysis relevant for research studies in cognition, with the goal to level-up your knowledge and optimize the time spent on your research.

- EEG/ERP data analysis with asa software
- Analysis of motion artefacts, TMS, tDCS and MRI artifacts
- Strategies for artifact correction
- Possible extension for advanced topics

Participants are required to bring their own laptop.

Workshop 3: TMS Neuronavigation and EMG motor mapping with visor2

By Sebastian Carstens
Time: 15:30 – 17:00

During this workshop you will learn how to work with the state-of-art TMS navigation system. **visor2** leverages meticulous digitization procedures to reliably create an easily navigable 3D head-space for real-time targeting, functional mapping, and analysis. During the workshop you will gain broad knowledge of practical applications, system's features, and a variety of available extensions. Through highly advanced 3D visualization in **visor2** you will be able to see how the magnetic field is generated by TMS in relation to the subject's brain in real-time. Additionally, you will learn how to use the system for EMG motor mapping.

- Setting up patient data (standard and individual patient MRI)
- General navigation of Magstim TMS coil
- EMG motor mapping
- Export and review of TMS sessions

Friday Morning

Neuroscience symposium

Symposium chair: Dr. John J. Foxe

- 9:00 - 9:30 **Introduction talk by John J. Foxe**
- 9:30 - 10:30 **Keynote talk by David Liley**
[Simultaneous EEG and MEG in non-lesional epilepsy and anaesthesia](#)
- 10:30 - 11:00 Coffee break
- 11:00- 11:20 **MEG connectivity analysis: validation and application to multifocal epilepsy**
Thomas R. Knösche, MPI for Human Cognitive and Brain Sciences, Leipzig, Germany
- 11:20 - 11:40 **EEG studies of functional connectivity in patients with psychogenic non-epileptic seizures**
Maria G. Knyazeva University of Lausanne, Switzerland
- 11:40 - 12:00 **On the quest for innovative electrode solutions for EEG signal acquisition: from the gel paste to dry electrodes** Carlos Fonseca, University of Porto, Portugal
- 12:00 - 12:20 **A 64-channel dry multipin-electrode cap for EEG** Jens Haueisen, Ilmenau University of Technology, Germany
- 12:20 - 12:40 **Contact force and impedance in dry electroencephalography** Patrique Fiedler, Ilmenau University of Technology, Germany
- 12:40 - 13:00 **Changes of functional organization in the developing sensorimotor cortex** Silvia Comani, University "G. d'Annunzio" of Chieti-Pescara, Chieti, Italy
- 13:00 - 15:00 Lunch

Friday Afternoon

Neurology, psychiatry and psychology symposium

Symposium chair: Dr. Stefan Rampp

- 15:00 - 15:30 **Introduction talk by Stefan Rampp**
- 15:30 - 16:10 **Invited speaker talk by Martijn Arns**
[First EEG results of the iSPOT study in Depression: EEG alpha asymmetry as a gender specific predictor of treatment outcome to Sertraline and Escitalopram.](#)
- 16:10 - 16:30 **Visual, auditory and bimodal ERP oddball designs in patients with schizophrenia, schizoaffective disorder and bipolar disorder. Does the use of different oddball tasks have an impact on the P300 component?** Hendrik Kajosch, Université Libre de Bruxelles, Belgium
- 16:30 - 17:00 Coffee break
- 17:00 - 17:20 **The P300 and the NoGo-P300 event-related potentials: biological markers of abstinence vs. relapse in alcohol dependence?** Salvatore Campanella, Université Libre de Bruxelles, Belgium
- 17:20 - 17:40 **Infraslow (< 0.1 Hz) EEG activity in postanoxic encephalopathy**
Michel J.A.M. van Putten, University of Twente, Netherlands
- 17:40 - 18:00 **The origin of lambda waves** Cyrille Ferrier, University Medical Center Utrecht, The Netherlands
- 18:00 - 18:20 **Monitoring Neuro-motor Recovery from Stroke with High-resolution EEG, Robotics and Virtual Reality** Lorenzo Schinaia, University "G. d'Annunzio" of Chieti-Pescara, Chieti, Italy

Friday Talks and Workshops

Keynote talk by Prof. David Liley

Simultaneous EEG and MEG in non-lesional epilepsy and anaesthesia

It is often erroneously assumed that MEG is a substitute for high density EEG. However in the pre-surgical workup for non-lesional (MRI negative) drug refractory focal epilepsy both the EEG and MEG provide vital complimentary information for the subsequent placement of ECoG grids/stereo-EEG electrodes and eventual excision boundaries. Whereas in investigations of anaesthetic-induced cortical-level network perturbations EEG provides the bridge between the MEG based high-fidelity beamformer analysis and clinical depth of anaesthesia monitoring. Professor Liley will outline his recent work involving the simultaneous recording of EEG and MEG in these situations and discuss how such measurements will contribute to a better understanding and characterisation of brain dynamics.

Invited speaker talk by Dr. Martijn Arns

First EEG results of the iSPOT study in Depression: EEG alpha asymmetry as a gender specific predictor of treatment outcome to Sertraline and Escitalopram.

Measures of alpha and theta electroencephalogram (EEG) activity often differentiate patients with major depressive disorder (MDD) from normal controls, and some evidence suggests these measures relate to overall antidepressant response. This study aimed to determine whether these measures would distinguish MDD patients from controls, whether these measures behave as overall and differential predictors of outcome to three antidepressants and to explore the effects of gender.

In the international Study to Predict Optimized Treatment Response in Depression (iSPOT-D), a multi-center, international, randomized, prospective open-label trial, 1008 MDD patients were randomized to Escitalopram, Sertraline or Venlafaxine-XR and 336 controls were assessed. Treatment response was established after eight weeks and resting state EEG was assessed at baseline.

Friday workshops

Open questions & answers session

By Bram van de Laar, Martijn Schreuder, Sebastian Carstens and Will Cuthbert

Time: 9:00 – 10:30

Available products and systems: **asa**, **asalab**, **eego** solutions, **waveguard** caps, **smartmove**, **visor2**, **xensor**

This session will be dedicated to answering questions related to the use of ANT products and systems. During this session our product experts will reserve time to analyze your current situation, answer your questions and advise you how to use the systems to achieve the best outcome.

Please note that making an appointment in advance is required, whether by email (neuromeeting@ant-neuro.com) or on-site by approaching Petra Spéh.

Workshop 1: Combined TMS and EEG experiments with visor2

By Sebastian Carstens and Bram van de Laar

Time: 11:00 – 12:30

The combination of TMS with simultaneous EEG provides the possibility to non-invasively probe the brain's excitability, time-resolved connectivity, and instantaneous state. The leading edge **visor2** navigation system together with the well-known, high-quality ANT Neuro EEG products allow highly sophisticated scientific studies. In this presentation we show the general setup of combined TMS & EEG setups and challenges that come with it (e.x. TMS artefacts in the EEG signal):

- Fundamentals of combined TMS and EEG
- Setting up **visor2** and EEG
- Possible TMS artifacts and how to resolve them
- How to analyze the gained EEG signals

Workshop 3: Real-time analysis and visualization of EEG.

By Bram van de Laar and Martijn Schreuder

Time: 15:00 – 17:00

Traditionally, EEG analysis is done after the recording is finished. However, there is a growing trend towards real-time analysis of EEG data, for the purpose of controlling the environment (BCI) or optimizing brain behavior (Neurofeedback). In this hands-on workshop we will introduce you to the fundamentals of these technologies, and several people will be able to experience it. In addition, we will provide you with concrete tips for how to start with this kind of research with your ANT devices, based on the interfaces that are released at this meeting.

Saturday Morning

Free communication symposium

Symposium chair: Dr. Thomas Knösche

- 9:00 - 9:10 **Introduction talk by Thomas Knösche**
- 9:10 - 9:30 **Non-invasive deep neurostimulation as a treatment for post-traumatic stress disorder**
Jonathan R. Young, Stony Brook University School of Medicine, USA
- 9:30 - 9:50 **Directional recording of subthalamic spectral power densities in Parkinson's disease and the effect of steering deep brain stimulation**
LJ Bour, Academic Medical Center, University of Amsterdam, the Netherlands
- 9:50 - 10:10 **Neuro-Navigated Targeting of the DLPFC: Two Easy Methods**
Benjamin Pommier, CHU Saint Etienne, Neuropain INSERM U1028, France
- 10:10 - 10:30 **Paired pulse TMS-EMG and TMS-EEG in epilepsy**
Annika A. de Goede, University of Twente, the Netherlands
- 10:30 - 11:00 Coffee break
- 11:00 - 11:20 **Use of ICA in psychiatric qEEG** Otte Georges and Geert De Bruecker, P.C. dr. Guislain, Gent, Belgium P.C. dr. Guislain, Gent, Belgium
- 11:20 - 11:40 **Guidelines, tactics and strategies to optimize the use of event related potentials in clinical psychiatry.** Otte Georges, P.C. dr. Guislain, Gent, Belgium
- 11:40 - 12:00 **Visual, auditory and bimodal oddball designs: does it have an effect on the sensitivity of ERP components?** Salvatore Campanella, Université Libre de Bruxelles, Belgium
- 12:00 - 12:20 **The frontal and parietal P3 amplitude indicate compensated cognitive processing**
Rik van Dinteren, Brainclinics research Institute, the Netherlands
- 12:20 - 12:40 **Can the estimates of functional connectivity from low-density EEG be reliable?**
Elham Barzegaran, University of Lausanne, Lausanne, Switzerland
- 12:40 - 13:00 **Using neuro-fuzzy in brain computer interface** Taleb Mahir, Belkaid University, Algeria
- 13:00 - 15:00 Self-serve lunch

Friday workshop

Open questions & answers session

By Bram van de Laar, Martijn Schreuder, Sebastian Carstens and Will Cuthbert

Time: 9:00 – 10:30

Available products and systems: **asa**, **asalab**, **eego** solutions, **waveguard** caps, **smartmove**, **visor2**, **xensor**

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Please note that making an appointment in advance is required, whether by email (neuromeeeting@ant-neuro.com) or on-site by approaching Petra Speh.

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