



**GK-Emotions – 20<sup>th</sup> Summer School 2016**

**From genotype to phenotype:**

**Emotions in the spotlight**

**October 6<sup>th</sup> to 8<sup>th</sup>, 2016**

**Environmental Education Center Oberelsbach, Germany**

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## Thursday, October 6<sup>th</sup> 2016

**2.00 pm**    **Arrival and Coffee**

**2.15 pm**    *Official Start of the Meeting*

***Prof. Paul Pauli  
Dominik Kiser***

**2.30 pm**    **Student Talks - Session 1**

Milad Mohamadi  
Valentina Haspert  
Octavia Madeira  
Daniel Gromer  
Bastian Söhnchen

**4.00 pm**    *(Coffee) Break*

**4.15 pm**    **Student Talks - Session 2**

Dr. Sina Kollert  
Alexandra Braun  
Dominik Kiser  
Emanuela Corradino  
Charlotte Auth  
Benjamin Aboagye

**6.15 pm**    *Leisure Time*

**7.00 pm**    **Dinner**

**8.30 pm**    *Departure - Social Event (night walk through the marsh)*

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## Friday, October 7<sup>th</sup>, 2016

**8.00 am Breakfast**

**9.15 am** *Student Talks - Session 3*

Marius Rubo  
Loic Botrel  
Dr. Kristina Suchotzki  
Mahero Ayesha Shah  
Andrea Katzorke  
Bibiane Simons

**11.15 am Coffee Break**

**11.30 am** *Lecture - Special Guest*

**Prof. Dr. Haye Hinrichsen**  
"Intonation and Temperaments - About Music, Mathematics, and Psychoacoustics"

**1.00 pm Lunch**

**2.30 pm** *Lecture*

**Prof. Dr. Christian Plewnia**  
"Targeting the biased brain. Modulation of cognitive control by transcranial brain stimulation"

**4.00 pm Coffee Break**

**4.15 pm** *Lecture*

**Hannah Genheimer**  
"Conditioning - a powerful model to investigate fear and anxiety"  
**Dr. Marta Andreatta**  
"BDNF polymorphism as mediator for conditioned contextual anxiety"  
**Dr. Ivo Heitland**  
"Human candidate gene studies as a translational tool for developing novel anxiety medications"

**6.15 pm Leisure Time**

**7.00 pm** *Special dinner with regional specialties ( Rhöner Genüsse )*

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## Saturday, October 8<sup>th</sup>, 2016

**8.30 am    Breakfast**

**9.30 am    Lecture**

***Cade McCall, Ph.D.***

*"Virtual Ethology: Using Virtual Reality to Study Human Affect"*

**11.00 am    Coffee Break**

**11.15 am    Lecture**

***Dr. Guillaume Chanel***

*"Socio-affective computing in 3B: Brain, Body, Behavior"*

**12.45 pm    Official end of the meeting**

**1.00 pm    Lunch**

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## Student Talks

### Session 1 (Thursday, October 6<sup>th</sup> - 2.30 pm)

Name	Title
<b>Milad Mohamadi</b>	Nociception and Relief: From Pain to Pleasure
<b>Valentina Haspert</b>	Regulation of pain with acceptance-based strategies
<b>Octavia Madeira</b>	Adapting the elevated plus maze for humans - A virtual reality study
<b>Daniel Gromer</b>	Psychophysiology in Virtual Reality Height Exposure
<b>Bastian Söhnchen</b>	Does social anxiety change the way we move?

### Session 2 (Thursday, October 6<sup>th</sup> - 4.15 pm)

Name	Title
<b>Sina Kollert</b>	Inwardly rectifying and two-pore domain potassium channels as downstream targets of G protein-coupled receptors in nociception and anxiety
<b>Alexandra Braun</b>	Resilience in the fibromyalgia Syndrome
<b>Dominik Kiser</b>	Emotional and molecular consequences of Cdh13 deficiency and early life stress
<b>Emanuela Corradino</b>	Influence of CDH13 and Maternal Separation on gene expression of brain regions related to Neurodevelopmental Disorders
<b>Charlotte Auth</b>	The effect of the interaction between serotonin deficiency and maternal separation on emotional regulation in mice
<b>Benjamin Aboagye</b>	Effect of time specific Tph2 gene deletion on anxiety and fear-like behavior in mice

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### Session 3 (Friday, October 7<sup>th</sup> - 9.15 am)

Name	Title
<b>Marius Rubo</b>	Social content predicts gaze fixations in dynamic scenes
<b>Loic Botrel</b>	Brain Computer Interfaces at home for artistic expression
<b>Kristina Suchotzki</b>	Lie to me: A cognitive approach to deception
<b>Mahero Ayesha Shah</b>	Resting heart rate variability is associated with inhibition of conditioned fear
<b>Andrea Katzorke</b>	Functional near-infrared spectroscopy during a verbal fluency task in elderly
<b>Bibiane Simons</b>	Transcranial direct current stimulation of the right inferior frontal Cortex attenuates sustained fear

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## Abstracts Lectures

**Haye Hinrichsen** - "Intonation and Temperaments - About Music, Mathematics, and Psychoacoustics"

*University of Würzburg, Germany*

Music belongs to the most fascinating aspects of Human civilization. In this context the notion of harmony of musical intervals plays a central role. For example, a perfect fifth is perceived as pleasant while the impression of a tritone is clearly less harmonious. Our ability to distinguish pleasant and unpleasant combinations of tones can be traced back to the physics of sound waves and psychoacoustic aspects of sound perception. Surprisingly, it turns out that a musical scale of perfectly harmonious intervals is mathematically impossible. This inevitable inconsistency led to a fascinating development of tuning systems called temperaments, ranging from the Pythagorean temperament to the so-called Equal Temperament (ET), which established itself as the standard tuning system of Western music in the 20. century. The talk outlines the history of temperaments, discusses the shortcomings of the ET, and discusses possible improvements using dynamical tuning algorithms.

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**Christian Plewnia** - *“Targeting the biased brain. Modulation of cognitive control by transcranial brain stimulation”*  
*University of Tübingen, Germany*

Deficits in cognitive and behavioral control are very common in many psychiatric disorders like for instance depression, anxiety, addiction, and eating disorders. Therefore, targeted improvements of executive functions provide interesting behavioral treatment options. In this talk, I will sketch this concept, describe the common transcranial brain stimulation methods, give some examples for the malleability of cognitive control by transcranial brain stimulation and discuss the resulting therapeutic perspectives.

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**Ivo Heitland** - "Human candidate gene studies as a translational tool for developing novel anxiety medications"

*Hannover Medical School, Germany*

During the last years, candidate gene studies have endured substantial criticism, mostly because replication rates are generally low and effect sizes tend to be small. While this criticism is generally valid, candidate gene studies are great tools to bridge the gap between promising preclinical and molecular findings and human pharmacological interventions.

Here, I will illustrate how our lab used human candidate gene studies to investigate the role of the cannabinoid system and the corticotropin releasing hormone (CRH) system in human fear and anxiety. Preclinical data regarding the impact of these systems on fear and anxiety has been very promising, with converging evidence linking cannabinoids to fear extinction and CRH to the acquisition of fear. However, human translational studies are very sparse, most likely due to the lack of pharmacological compounds administrable to humans.

To bridge this gap between promising preclinical findings and the human realm, we conducted several studies on fear and anxiety using specific candidate polymorphisms within the cannabinoid receptor 1 (CB1) and the corticotropin releasing hormone receptor 1 (CRHR1) using healthy humans subjects. Briefly summarized, participants completed well-established fear conditioning paradigms while subjective (ratings, shock expectancy) and physiological data (fear potentiated startle) were recorded.

These studies showed considerable impact of a particular polymorphism within CB1 on the extinction of fear, while a polymorphism within CRHR1 was linked to fear acquisition. After

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successful translation from preclinical data to human genetics, we followed up with a pharmacological administration study in humans using synthetic cannabidiol, a cannabinoid-based compound thought to enhance fear extinction. Data from healthy volunteers will be presented at the meeting, a study within a clinical anxiety sample is currently running.

Taken together, I will describe our labs' view and experiences with regard to using human candidate gene studies as a translational tool for developing novel anxiety medications.

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**Cade McCall** - “Virtual Ethology: Using Virtual Reality to Study Human Affect”

*University of York, United Kingdom*

We live in dynamic and complex environments in which we are surrounded by people and things that evoke a wide range of emotional experiences. Nevertheless, psychologists and neuroscientists typically study affect in pared-down laboratory environments that offer a high degree of experimental control and the opportunity for precise measurement but are, nevertheless, quite different from everyday settings. But unlike traditional experimental platforms, immersive virtual reality allows participants to freely explore and interact with complex but controlled three-dimensional scenes. Digital motion tracking and physiological sensors further provide precise and continuous measurement of participants' responses while inside these environments. Over the course of this session, I will discuss two lines of research that employ these technologies to study human affect and social responses. First, I will present evidence that subtle differences in gaze and social distance during face-to-face interactions reveal interpersonal attitudes and, further, predict more substantive behaviors such as aggression and prosocial behavior. Next, I will present ongoing research on the interrelationship between physiology, subjective experience, and behavior during the exploration of emotionally evocative environments. Together these data illustrate the benefits of using virtual reality to study feelings and emotions as they naturalistically unfold. We will conclude the session with a broader discussion of the costs, benefits, and untapped potential of using virtual reality in affective science.

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**Guillaume Chanel** - *“Socio-affective computing in 3B: Brain, Body, Behavior”*

*University of Geneva, Switzerland*

Socio-Affective computing aims at the creation of machines which can take into account emotions and social norms in their interaction with humans. It is often decomposed into two main components: the detection of social signals (including emotions) and the synthesis of those signals. This socio-affective loop between the human and the machine can then lead to a better interaction where machines can show some form of empathy. In this talk I will present several measures and methods that can predict computer users' emotions and properties of social interactions (e.g. conflict, grounding, etc.). The emphasis will be put on physiological (electrodermal activity, heart rate, etc.) and brain signals (EEG) but some behavioral measures will also be presented. The research will be illustrated with applications toward entertainment and mediated collaboration.

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