	Monday 31st	Tuesday 1st	Wednesday 2nd	Thursday 3rd	Friday 4th
09:30 - 10:30	Registration	Micah Allen	Ivana Konvalinka	Marzia De Lucia	Andrea Serino
10:30 - 11:00	Welcome & Inspiration	Break	Break	Break	Break
11:00 - 12:00	Michael Gaebler	Francesca Fardo	Gerardo Salvato	Yuri Antonacci	Oral Presentations
12:00 - 13:00	Juliane Britz	Oral Presentations	Oral Presentations	WORKSHOP Yuri Antonacci	Wrap-up & Highlights
13:00 - 15:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
15:00 - 16:00	Hyeong-Dong Park	Oral Presentations	Ronny Bartsch	Trabocchi Coast Experience	
16:00 - 16:30	Break	Break	Break		
16:30 - 18:00	Poster Session	WORKSHOP Micah Allen & Francesca Fardo	WORKSHOP Ronny Bartsch		
	Welcome Dinner & DJ Set			Sunset & Social Dinner	

Yuri Antonacci, **University of Palermo, Italy**

Title: From Brain Dynamics to Brain-Heart Interactions: An Information-Theoretic Perspective

Abstract:
Understanding how the brain interacts with the body remains a central challenge in neuroscience, as these interactions span multiple temporal scales and levels of organization. This lecture presents recent approaches to study brain-heart interactions, moving from the analysis of individual brain dynamics to the characterization of interactions within physiological networks.
Methods to investigate brain responses to cardiac activity are introduced, including information-theoretic approaches to quantify neural dynamics, which enable the characterization of both evoked components and the modulation of the temporal structure of brain signals associated with cardiac processing. Approaches to assess pairwise interactions between brain and cardiovascular signals are then discussed, together with extensions to multivariate settings, where higher-order interactions reveal coordinated activity across multiple systems. Applications to experimental data illustrate how these approaches provide complementary insights into the dynamic organization of brain-body coupling across different physiological states, such as wakefulness, sleep, and orthostatic stress.

Bio:
Yuri Antonacci is an Assistant Professor in Biomedical Engineering at the University of Palermo (Italy). He received his Ph.D. in Bioengineering from the University of Rome “La Sapienza” in 2021 and subsequently held postdoctoral positions at the University of Palermo, working on complex systems and biomedical signal analysis. His research focuses on the development of advanced methods for biomedical signal processing, with particular emphasis on information theory and network physiology applied to brain and cardiovascular dynamics. He has authored over 70 peer-reviewed publications in the fields of biomedical signal processing, complex systems, and physiological interactions in healthy and pathological conditions.

Ronny Bartsch, Bar-Ilan University, Israel

Title: Coexisting Coupling Modes and Network Interactions in Physiology

Abstract:
Physiological systems interact across multiple time scales to generate coordinated function, yet the nature of these interactions and their organization remain poorly understood.
In this lecture, we present recent results on coexisting forms of coupling between organ systems, including synchronization, coordination, and time-delay stability, and show how these distinct interaction modes reflect different regulatory mechanisms. Using multimodal physiological recordings (EEG, ECG, respiration), we reconstruct time-resolved networks of organ interactions and demonstrate how network structure rapidly reorganizes across physiological states, with a focus on sleep. We uncover robust, state-specific patterns of connectivity and link dynamics, revealing a strong relationship between network topology and physiological function. Furthermore, we show how these patterns are altered under pathological conditions, providing insight into system-level dysregulation. These findings highlight the importance of multiplex and time-varying interactions in physiology and establish a quantitative framework for linking dynamic network structure to function across scales.

Bio:
Ronny Bartsch is an Associate Professor of Physics at Bar-Ilan University, Israel. He studied physics in Konstanz (Germany) and at Bar-Ilan University, where he received his Ph.D. in 2009.
He subsequently held positions at Harvard Medical School and Boston University before joining the faculty at Bar-Ilan. His research focuses on the dynamics of physiological systems and how interactions among organ systems give rise to integrated function, with particular emphasis on sleep and Network Physiology. His work combines concepts from statistical physics, nonlinear dynamics, and data-driven analysis to uncover mechanisms of physiological regulation and dysfunction. He is a recipient of the Young Investigator Award of the German Society of Sleep Medicine and has held fellowships from Minerva, DAAD, and the Marie Curie program.

Michael Gaebler, **Max Planck Institute, Berlin**

Title: Heart-brain coupling and its role for the mind and behaviour

Abstract:
Heart-brain coupling not only maintains life but also shapes our mental states and behaviour. I will present a set of studies, in which we find that the cardiac phase influences how we perceive the world and interact with it. In addition, we investigate the functional relevance of heart-brain coupling with naturalistic studies using immersive virtual reality.

Bio:
Michael Gaebler is a cognitive and neuroscientist at the Max Planck Institute for Human Cognitive and Brain Sciences. Before his doctorate in Psychology (Humboldt-Universität zu Berlin), he studied Brain & Mind Sciences (MSc, University College London) and Cognitive Science (BSc, Universität Osnabrück). With his group, the Mind-Body-Emotion Group, he investigates how mental processes relate to brain-body interactions in pathology and health, over the lifespan, and when challenged (e.g., in affective states like emotions or acute stress). They conduct psychophysiological and neuroimaging studies in classical lab-based settings and using real-world (e.g., ambulatory assessment) and naturalistic setups (e.g., immersive technologies like virtual reality).

Marzia De Lucia

1. **Brain-Body and Consciousness Lab, Lausanne University Hospital and University of Lausanne**
2. **Center for Biomedical Imaging, Switzerland**

Title: ***Cardiac and auditory regularity processing in wakefulness, sleep and coma***

Abstract:
The brain continuously processes information from the external environment while monitoring internal bodily states. Although growing evidence suggests that the processing of bodily and external sensory stimuli is tightly intertwined and mutually influential, the extent of this interaction in altered states of consciousness remains poorly understood. Through a series of experiments in healthy individuals across different vigilance states and in comatose patients, I provide evidence suggesting that bodily signal processing is preserved or even enhanced in altered states of consciousness relative to wakefulness.
In particular, while in wakefulness we found robust evidence of both cardiac and auditory stimulus processing, during phasic REM sleep—a state of reduced responsiveness to the environment— we observed stronger responses to cardiac stimuli relative to wakefulness. Continuous monitoring of cardiac inputs in altered states of consciousness is further demonstrated by evidence that bodily rhythms interact with auditory stimulus processing in both sleep and coma. Unexpected sound omissions embedded within auditory sequences synchronized with the ongoing heartbeat (cardio-audio regularity) elicited a neural omission response during wakefulness, sleep and coma, particularly in patients with favorable outcomes. These findings are complemented by a modulation of the cardiac activity following omissions in cardio-audio sequences.
This body of work shows that brain-body interaction is largely preserved across conscious and unconscious states as it transpires both centrally, through the neural responses to cardiac and auditory signals, and peripherally, through measurements of cardiac modulation.

Bio:
Marzia De Lucia is a neuroscientist at the Lausanne University Hospital and the University of Lausanne, Switzerland. She obtained her PhD in Physics in 2004 from the University La Sapienza and she was research fellow at the Institute of Cognitive Neuroscience University College London and at the Medical Physics Department of the same university. In 2006, she joined the Center for Biomedical Imaging as research scientist in Lausanne. In 2016, she was appointed senior scientist and lecturer at the University of Lausanne and the University Hospital where she leads the Brain-Body and Consciousness lab. Since 2024, Marzia De Lucia, is also head of the Center for Biomedical Imaging EEG CHUV-UNIL Computational Electrical Neuroimaging Section.

Francesca Fardo, **Aarhus University, Denmark**

The thermal grill illusion: a window into how the brain constructs pain

Abstract:
The thermal grill illusion (TGI), the paradoxical experience of burning heat and pain evoked by the spatial interleaving of innocuous warm and cool temperatures, offers a unique experimental model for studying how the brain constructs pain in the absence of tissue damage. In this talk, I will present a series of studies from our lab investigating the psychophysical, computational, and neural mechanisms underlying this illusion. I will show how adaptive psychophysical methods reveal individual differences in TGI sensitivity, and how computational modeling explains the emergence of illusory pain through the integration of thermosensory signals. I will then discuss how these findings advance our understanding of the links between temperature and pain, and outline open questions and future directions for the field.

Short bio:
Francesca Fardo is an Associate Professor at the Center of Functionally Integrative Neuroscience (CFIN), Aarhus University, Denmark, where she leads the Body, Pain and Perception Lab. Her research investigates how the brain transforms sensory input into the subjective experience of pain, combining psychophysics, multimodal neuroimaging (MRI, EEG, MEG), and computational modeling. She received her PhD in Experimental and Clinical Psychobiology from the University of Padova, Italy, and held postdoctoral positions at University College London and Aarhus University. She is the recipient of a European Research Council (ERC) Starting Grant investigating illusions in the thermonociceptive system.

Gerardo Salvato, **University Of Pavia, Italy**

Title: Interoception as a Multilevel Scaffold of Well-Being: From Balance to Social Interaction

Abstract:
Interoception—the sensing, interpretation, and integration of signals originating from within the body—has emerged as a core mechanism supporting physiological regulation, self-awareness, and adaptive behavior. Rather than merely reflecting internal states, interoceptive signals contribute to predictive regulation and guide diverse facets of cognition. Within this framework, well-being can be conceptualized as the outcome of a dynamic balance between internal bodily signals and progressively higher-order processes, spanning basic bodily regulation, self-representation, decision-making, and social interaction. This talk presents a research program investigating interoception as a unifying mechanism underlying well-being across healthy individuals and clinical populations, proposing a hierarchical, body-centered perspective on cognition.

I will first focus on low-level bodily regulation, examining how interoceptive signals contribute to fundamental aspects of postural balance. Evidence from healthy individuals shows that cardiac awareness predicts postural stability, suggesting that access to internal bodily signals supports the fine-tuning of balance and the coordination of multisensory information necessary for adaptive interaction with the environment. From this basic regulation of bodily stability, interoceptive signals also contribute to the construction of a coherent sense of the body.

Experimental and neuropsychological evidence demonstrates that thermosensory and autonomic signals shape the sense of body ownership. Studies in stroke patients show that alterations in cutaneous thermal signals are associated with disturbances of body ownership, while broader evidence indicates that stroke can disrupt multiple interoceptive domains and impair physiological regulation. These findings align with emerging work on allostatic load, suggesting that altered interoceptive processing after stroke may affect adaptive regulation and recovery trajectories. Such alterations extend to conditions characterized by disturbed body representation, including eating disorders.

Multisensory integration paradigms reveal dissociations between physiological, perceptual, and subjective components of bodily self-awareness in anorexia nervosa, alongside evidence that interoceptive traits modulate implicit body-image processing. Variability in access to bodily information also impacts how individuals evaluate risks involving their own body. Across studies in healthy individuals, interoceptive signals modulate risk-taking, particularly when decisions involve

body-related stimuli, an association that is disrupted in extreme weight conditions such as anorexia nervosa and obesity.

Finally, thermal autonomic responses during mother–infant interactions show how interoceptive regulation unfolds within dyadic contexts, linking bodily states to early socio-emotional coordination. This body-centered perspective traces a continuum from the regulation of posture and bodily integrity to self-awareness, decision-making, and social interaction, framing interoception as a multilevel mechanism underlying well-being in healthy and pathological populations.

Bio:
Gerardo Salvato is a cognitive neuroscientist, psychologist–neuropsychologist, and psychotherapist. He is currently an Associate Professor in Neuropsychology and Cognitive Neuroscience at the Department of Brain and Behavioral Sciences of the University of Pavia. Since 2015, he has also served as a research consultant at ASST Grande Ospedale Metropolitano Niguarda in Milan, where most of his research activity is conducted. His work mainly focuses on how the brain represents the body in healthy and pathological populations, and on the role of multisensory integration in maintaining a coherent sense of self.

Juliane Britz, **University Of Fribourg, Switzerland**

Title: BBC – Brain, body and consciousness

Abstract:
Conscious awareness varies with trial-by-trial variations in spontaneous brain activity and with cyclic fluctuations of bodily signals such as cardiac and respiratory activity. I will present a series of studies in which we investigate brain-body interactions for conscious awareness and will show how

1. baroreceptor fluctuations across the cardiac and respiratory phase determine both the earliest electrophysiological marker and the trajectory of brain activity of awareness (Leupin & Britz, PNAS (2024))
2. the mode of breathing modulates awareness-related brain potentials (Leupin & Britz, nature Scientific Reports (2025))
3. the momentary state of the brain and the body contribute independently to awareness (Leupin & Britz, Brain Topography (2025))
4. interoceptive ability determines whether pre-stimulus heartbeat evoked potentials can predict visual awareness

Bio:
I studied psychology at the University of Konstanz in Germany and did my PhD in Cognitive Neuroscience at the University of Konstanz, Duke University and the University of California at Davis working on electrophysiological correlates of language processing in healthy young adults and aphasic patients.

After my time in the US, I decided to come back to Europe and did a postdoc with Christoph Michel at the University of Geneva and learned everything about topographic EEG analyes and EEG source imaging. I am now a lecturer at the University of Fribourg where I intend to stay.

My research encompasses two lines in which I use EEG (microstates) to

1. study the intrinsic spatio-temporal dynamics of spontaneous brain activity in healthy and clinical populations and their relationship to levels of consciousness and
2. investigate trial-by-trial variations in spontaneous brain activity to predict awareness and the contents of consciousness

More recently, I have started to tie the role of bodily signals into my existing lines of research.

Ivana Konvalinka, **Technical University Of Denmark (Dtu), Denmark**

Title: Balancing self and other during dynamic social interactions

Abstract:
Social interaction requires people to continuously monitor other's actions and bodily states and integrate them with their own, balancing self-other integration with segregation. However, the dynamic mechanisms underlying this self-other weighting remain poorly understood. In this talk, I will present perceptual paradigms, interactive experiments, and computational approaches that quantify how individuals integrate self and others during real-time observation and interaction. The ability to extract subtle physiological information from others' facial and bodily signals depends on perceptual context and interoception, with more interoceptive individuals being worse at "inferring others". Across interactive settings, interpersonal coordination of verbal and non-verbal rhythms perturbs intrapersonal coupling, with stronger social coordination leading to lower within-person coupling. Specifically, coordination of physiological rhythms is associated with reduced coupling of individual cardiorespiratory rhythms, while more coordinated face-to-face interactions are associated with higher self-decoupling of motor rhythms. In contrast, increased task difficulty leads to stronger self-coupling, indicating flexible shifts between other-oriented integration and self-stabilization. Finally, social factors modulate this balance, with less-connected individuals in social networks exhibiting greater integration of others. Together, these findings suggest that self-other integration is regulated through shifts in intra- and interpersonal coupling, which are modulated by interoception, task demands, and social factors.

Bio:
Ivana Konvalinka is an Associate Professor at the Section for Cognitive Systems, Technical University of Denmark (DTU Compute). She is interested in the brain-body mechanisms that underlie social cognition and interaction, particularly in the context of social coordination of actions. She studies how movements and physiological and neural signals are integrated within and between people during real-time social interaction, using EEG, physiological recordings, joint action paradigms, face-to-face communication studies, computational approaches, and more recently, studies of real-world social networks.

Hyeong-Dong Park, **University in Daejeon KAIST, South Korea**

Title: Breathing shapes conscious intention and agency

Abstract:
We previously reported that breathing is coupled with voluntary action and readiness potential. In this talk, I will present the results of four follow-up studies. First, breathing is also coupled with mental imagery, not involving an overt motor response. Second, the coupling between breathing and voluntary action is consistently observed across diverse motor response types. Third, experimental manipulation of the respiratory phase causally altered the readiness potential amplitude. Fourth, the differential respiratory phases are also associated with the altered sense of agency. Then, the results will be discussed in terms of the motor competition hypothesis.

Bio:
I am a cognitive neuroscientist investigating neural mechanisms of consciousness. I am currently an assistant professor in the Department of Brain and Cognitive Sciences at KAIST.

I received my Ph.D at Pierre and Marie Curie University (UPMC) in 2014, under supervision of Dr. Catherine Tallon-Baudry. Then I moved to Swiss Federal Institute of Technology in Lausanne (EPFL) and worked as a post-doc, with Prof. Olaf Blanke, until 2020. Then, I worked as an associate professor at Taipei Medical University in Taiwan until July 2023.

Our lab investigates how interactions between the brain and body (e.g., heart, lung, stomach) play functional roles in human conscious experiences, including perceptual awareness, bodily self-consciousness, and voluntary action.

Andrea Serino, **University Hospital Lausanne & University Of Lausanne**

Title: Rethinking Peripersonal Space: Neural Mechanisms Across Space, Time, and the Body

Abstract:
The term Peripersonal Space (PPS) refers to the space immediately surrounding the body, where interactions with the external world unfold. In this lesson, I will introduce what PPS is, how it has been traditionally studied, what are the current theories conceptualizing it.

I will then present my current view of PPS as a dynamic interface between the self and the environment, highlighting its multisensory, motor, and plastic properties. I will then develop my position: that PPS should be understood not only as a spatial representation, but as a neural mechanism that integrates bodily and external signals across both space and time, supporting predictions about body–object interactions.

I will review recent empirical findings that link PPS to forms of consciousness, including its role in minimal, pre-reflective self-experience, as well as its alterations in psychiatric and neurological disorders. Finally, I will introduce a new and emerging line of research exploring the interaction between PPS and the immune system, suggesting that PPS-related predictive mechanisms may extend beyond the brain to influence broader physiological regulation.

Together, this lesson will provide students with both a solid grounding in PPS and a forward-looking perspective on its role in shaping perception-action, cognition, consciosness and bodily regulation.

Bio:
Andrea Serino, Prof, PhD is Professor at the University Hospital of Lausanne and University of Lausanne, where he directs the Neurorehab Research Center and MySpace Lab. The lab investigates the neural basis of body representation in space for action, perception and consciousness. Neurorehab has the mission of translating this knowledge to develop novel solutions for neurological disease.