States of Consciousness: Comparing Meditation, Hypnosis, Trance and Psychedelics from a first- and third-person Perspective

11th to 15th June 2019 - Schloss Buchenau, Germany

2nd Mind & Life Europe Workshop of the European Neurophenomenology, Contemplative, and Embodied Cognition Network (ENCECON)

MIND & LIFE EUROPE

Welcome!

Dear Friends,

On behalf of Mind & Life Europe, we are delighted to welcome you at the second workshop of the European Neurophenomenology, Contemplative, and Embodied Cognition Network (ENCECON) at Schloss Buchenau, Germany.

The main aim of the ENCECON workshops is to provide for an in-depth and integrated discussion of what is known, what is not known, and what approaches could be taken to address outstanding questions in a particular field related to the understanding of mind and consciousness from the first- and third-person perspectives.

The initial ENCECON meeting took place in June 2016, exploring three topics related to contemplative neuroscience: 1) the role of the brain resting state in meditation, 2) the role of the body in meditation, 3) neuro-phenomenology. The feedback has been very positive with the speakers/participants keenly looking forward to further meetings.

In this second workshop, themed 'States of Consciousness: Comparing Meditation, Hypnosis, Trance and Psychedelics from a first- and third-person perspective', we would like to explore the similarities and differences in phenomenology and the neural dynamics of meditation, hypnosis, trance, and psychedelics.

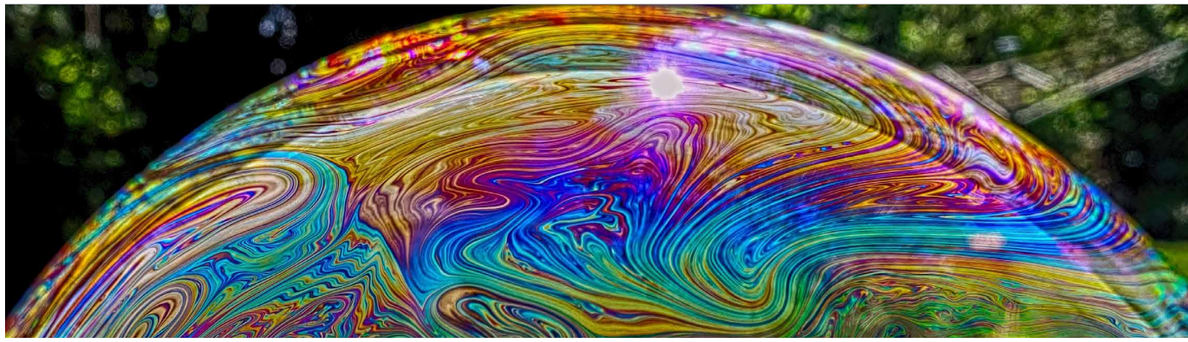
Each workshop day is structured to allow time for theoretical discussions, methodological brain-storming sessions, and first-hand explorations of states of consciousness under the question, in addition to brief presentations of key findings from each field. We have also scheduled time on our last day together for the discussions of manuscripts as a workshop output, as well as collaborative networks for joint grant applications.

We hope that the experiences of our time together will not only bring increased knowledge and deeper insights into our work, but forge new relationships and create new opportunities to advance the future research into the nature of human consciousness.

With warm wishes from the members of the planning committee:

Tania Singer, Steven Laureys, Antoine Lutz, Diego Hangartner, Cornelius Pietzner *(Director MLE)*, **Elena Antonova** *(chair)*

The second ENCECON Workshop is organized by Mind & Life Europe in collaboration with the planning committee members chaired by Elena Antonova (Institute of Psychiatry, Psychology and Neuroscience, King's College London), Tania Singer (Social Neuroscience Lab, Max Planck Society Berlin), Steven Laureys (Coma Science Group at GIGA (ULg) and Department of Neurology, Liège University Hospital), Antoine Lutz (Lyon Neuroscience Research Center, Lyon 1 University), and Diego Hangartner (The Wheel of Mental Balance).



Biographies & Abstracts

Elena Antonova

Dr Elena Antonova is a Lecturer at the Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK.

She has obtained BSc in Psychology from the University College London, UK, in 2000 and the PhD in Cognitive Psychology from the Institute of Psychiatry, UK, in 2004. Her main research interest is the neuroscience of mindfulness using psychophysiology and neuroimaging methods with the application to the prevention and management of psychosis and schizophrenia. Dr Antonova held Templeton Positive Neuroscience Award between 2011-2013 for the project investigating the effect of mindful attention on sensory information processing in expert mindfulness practitioners (http://www.posneuroscience.org/research-awards.html). She has been actively involved with Mind and Life Europe since 2013. Her contribution to the field of contemplative science has been recognized with an election as the Mind & Life Research Fellow in November 2017. Dr Antonova has a strong interest in the Philosophy of Mind, both Western and Eastern schools of thought, with the application to the foundational issues in neuroscience and psychiatry.

Website: https://kclpure.kcl.ac.uk/portal/elena.antonova.html

Probing state and trait effects of mindfulness meditation using psychophysiological measures

Mindfulness is the awareness of the present-moment experience without preference or judgement. As such, mindfulness as a state should result in openness to repetitive stimuli, even of aversive. We tested this expected effect using startle habituation paradigm and found that people who meditate more intensely habituated less to auditory startles compared to meditation-naïve individuals and meditators with more moderate mediation practice regime, with the degree of habituation being directly related to the intensity of practice (Antonova, Chadwick, Kumari, 2015). By the virtue of being anchored in the present-moment experience, mindfulness should also result in less anticipatory attention and therefore better performance on the tasks where anticipation would be detrimental for the task performance.

We tested this prediction using eye-movement paradigm and observed fewer catch-up errors in anticipatory saccades, as well as lower intra-individual variability of gain and spatial error over trials in meditators compared with meditation-naïve controls (Kumari et al, 2017). Furthermore, better smooth pursuit and antisaccade performance was associated with higher scores on observe and non-reactivity facets of the Five Facet Mindfulness Questionnaire (Baer et al, 2006) in meditators, but not in controls, suggesting that it is only practicing mindfulness as a state that results in diminished anticipatory attention as a trait. Together, our research shows that mindfulness practice exerts measurable effects on mechanisms that are thought to be hard-wired and normally stable as a psychophysiological trait.

Thorsten Barnhofer

Thorsten Barnhofer is a Professor of Clinical Psychology at the University of Surrey, where he conducts research into the use of mindfulness-based interventions for the prevention and treatment of mental disorders. He has a particular interest in the mechanisms through which mindfulness meditation benefits adaptive psychological and neural functioning across the life span.

Mindfulness training in the treatment of persistent depression: can it reverse maladaptive plasticity?

In many patients, depression takes a recurrent or chronic course in which maintaining mechanisms become increasingly engrained, and repeated stress translates into significant changes in biological functioning. The introduction of mindfulness training has brought a paradigmatically new approach to the treatment of persistent courses of depression that promises to counter such mechanisms and thus offers potential to eventually reverse maladaptive plasticity. However, research on biological mechanisms of mindfulness training in this domain is still widely lacking.

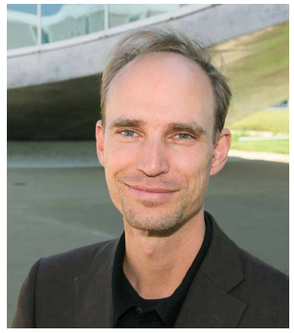
In this talk I will present findings from a study that investigated the effects of a brief mindfulness training on resting state parameters in EEG and MRI and discuss the findings in a broader framework that is aimed at helping our understanding of how effects of the training may translate into more lasting effects that may eventually help to counter psychobiological maintenance mechanisms.

Prisca Bauer

Prisca Bauer is a post-doc at the Lyon Neuroscience Research Center, France. She obtained her MD from Utrecht University, The Netherlands, and her PhD in Epileptology and Neurophysiology from University College London, UK in 2016. In 2017 she was awarded a two-year Marie Sklodowska-Curie Fellowship to study the neural correlates of mindfulness meditation and hypnosis in the team of Dr. Antoine Lutz. In addition, she is involved in developing mindfulness-based approaches to improve the quality of life in people with epilepsy. During her fellowship, she developed a strong interest in (micro-)phenomenology, and its use in scientific and clinical contexts.

The relation between trait measures of mindfulness meditation and hypnosis

Aptitude to enter states of hypnosis (hypnotisability) and mindfulness meditation vary from person to person, and may be linked to specific traits. It is unclear how hypnotisability and mindfulness traits are linked with each other. It was previously hypothesised that people who are highly hypnotisable have lower measures of mindfulness and vice versa. To test this hypothesis, we evaluated hypnotisability using the Harvard Group Scale form A, and trait mindfulness using the Five Facet Mindfulness Questionnaire in hundred healthy adult participants. We found no correlation between these two measures. Traits linked to mindfulness and hypnotisability are thus not mutually exclusive. This study highlights fundamental differences in the way hypnotisability and mindfulness are measured, and the need for more refined tools to measure traits and aptitude for these states.



Olaf Blanke

Prof. Olaf Blanke, MD, is Bertarelli Foundation Chair in Cognitive Neuroprosthetics at the Swiss Federal Institute of Technology (EPFL), where he directs the Laboratory of Cognitive Neuroscience at Geneva's Campus Biotech. He founded and directed EPFL's Center for Neuroprosthetics (2012–2018) and is Professor at Geneva University Hospital. Blanke's research focuses on the neuroscience of multisensory perception, consciousness, and the self. Most recently, Blanke has pioneered cognitive neuroprosthetics – the development and integration of robotic and virtual reality technology with neuroscience and medical research. His medical activities are dedicated to the application of these neuroprosthetic innovations to diagnostics and therapeutics (in neurological and psychiatric patients) as well as well-being and meditation.

Websites: https://lnco.epfl.ch/ and http://cnp.epfl.ch/

Coupling inner and outer body for self-consciousness

Based on latest evidence on the relevance of interoceptive bodily signals (cardiac and respiratory signals) and multisensory exteroceptive bodily signals for self-consciousness, I will propose an integrated neural system reconciling these two largely separated views. I argue that such an integrated system is based on torso-centered signals in a distributed cortical network and delineate how it accounts for fundamental aspects of self-consciousness such as self-identification, experienced global unity, and temporal continuity.

Rael Cahn

Rael Cahn is Assistant Professor with the Department of Psychiatry at the USC Brain and Creativity Institute. He has been conducting neuroscientific research on meditation and psychedelics since 2001 and has published numerous basic neuroscience investigations of meditation and psilocybin-induced states and traits of consciousness. Dr Cahn's current research investigates: i) the neurophysiologic mechanisms underlying non-dual and narrative-free awareness in long term meditators; ii) clinical benefits of mindfulness practices for depression, trauma, anxiety and addictions; iii) epigenetics underlying the clinical efficacy of MDMA-Assisted Psychotherapy for PTSD; and iv) clinical and neuroscientific effects of the synergistic use of psychedelic medicines and contemplative practices for potentiating their benefits for psychological health and well-being.

Neurophysiology of meditative and psychedelic states – Insights into the healing potential of contemplative practices and psychedelics

Dr. Cahn will provide an overview on the neurophysiology of meditative and psychedelic states of mind and the relation between these mind-brain states and healing mechanisms for anxiety, depression, obsessionality, and existential suffering. He will present his research findings assessing the effects of both meditation and the psychedelic agent psilocybin on the brain correlates of sensory and cognitive processing, highlighting areas of similarity and differences. He will then use recent neurophysiologic findings to draw hypotheses about the potential of these approaches for providing relief from suffering and enhancing well-being and psychological flexibility.

Quinton Deeley

I am Senior Lecturer in Social Behaviour and Neurodevelopment at the Institute of Psychiatry, Psychology, and Neuroscience (IOPPN), King's College London. I am also Consultant Neuropsychiatrist in the National Autism Unit and Neuropsychiatry Brain Injury Clinic at the Maudsley and Bethlem Hospitals. I chair the Maudsley Philosophy Group, and Social and Cultural Neuroscience Group at the IOPPN. I have researched the relations between culture, cognition and brain function since studying Theology and Religious Studies at Cambridge University, and later medicine at Guys and St Thomas' Medical School, London, and psychiatry at the Maudsley and Bethlem Hospitals. My work brings cognitive neuroscience research methods into dialogue with humanities scholarship to improve understanding of religious cognition, experience, and behaviour. Current research topics include researching voice hearing in patient groups and cultural practitioners, and how cognitive and brain processes involved in the formation of beliefs and experiences can be influenced by cultural practices such as ritual.

Website: https://www.csnlab.co.uk

Revelatory and visionary experience as dissociation of the self

Reports of supernatural agents (such as God or gods, demons, or spirits) speaking or acting through humans are present across cultures and periods of history in experiences of revelation and possession. Indeed, revelatory experiences form a key part of the formation and development of major world religions through figures such as prophets, visionaries, and yogins, as well as in the religious practice of shamans and others in traditional smaller-scale societies. The messages conveyed through visionary and revelatory experiences typically bear an intelligible relationship to the personal or collective context of practitioners. They can be evoked through the use of hallucinogens (such as ayahuasca), meditation and ritual (such as tantra, Chod or possession cults), and the use of suggestion in hypnosis. Revelatory experiences raise several interlocking questions. How can such radical dissociations of self-experience arise, and why can they be evoked by such diverse means? Why are revelatory experiences such a widespread mechanism for the disclosure of salient information about the self and world? And what distinguishes revelatory experience from psychopathology?

Marie-Elisabeth Faymonville

Marie-Elisabeth Faymonville is a specialist in Anaesthesia and Intensive Care Medicine. She developed, in 1992, a new method of anaesthesia: hypnosedation. This original approach was evaluated by retrospective and prospective clinical studies, which were published in a number of prestigious national and international journals. Since 1994, she has been teaching this technique in a free course at the University of Liege where more than 450 participants, coming from 4 different European countries, have already received this training. Her original clinical approach of the use of hypnosis in surgery, chronic pain, oncologic and palliative care enabled her to promote hypnosis as

a particularly interesting tool in modern medicine. Her work and her scientific notoriety, in the field of hypnosis, make of her an expert at an international level.

Website: http://www.algologie.ulg.ac.be/

Hypnosis, what about clinical research?

Hypnosis is widely used in clinical to alleviate pain, decrease side effects of treatments, and improve emotional regulation as well as global well-being of patients. We currently need robust clinical research paradigms to objectivize how hypnosis effectively affects the quality of life of patients. We will discuss about clinical application of hypnosis combined to self-care learning in different population of patients (chronic pain, oncology, etc.). Our studies showed that hypnosis/self-care learning is associated with patients' evolution of coping strategies from passive to active, allowing them to reduce pain perception and improve their global impression of treatment effectiveness. We will present how neuroimaging results allowed to understand these modifications of perception, especially pain perception.

Olivia Gosseries

Olivia Gosseries, PhD, is a neuropsychologist working at the GIGA-Consciousness at the University of Liege with Pr. Laureys. Her work mainly focuses on clinical assessments and electrophysiological measures of consciousness in patients with disorders of consciousness after a coma. Her tool of choice is the transcranial magnetic stimulation (TMS) combined with electroencephalography that she also uses to evaluate other modified states of consciousness such as hypnosis, meditation and cognitive trance. Moreover, she is interested in pharmacological (e.g., apomorphine, zolpidem) and brain stimulations (e.g., repetitive TMS, vagal nerve stimulation) treatments for post-comatose patients.

Olivia was a post-doctoral researcher for 3 years at the University of Wisconsin, Madison, USA with Pr G. Tononi doing sleep research, and with Pr. B. Postle doing working memory research. In the last years, she has also performed several editorial works, including editing the second edition of "the Neurology of Consciousness", being an associate editor for the journal Clinical Neurophysiology, and hosting two research topics on consciousness for the journals Frontiers.

Dealing with Cultural Diversity: TMS-EEG in altered states of consciousness

Transcranial magnetic stimulation (TMS) combined with high-density electroencephalography (EEG) has been used to assess brain functions in physiological (e.g., sleep, meditation, cognitive trance), pharmacological (e.g., propofol, ketamine, xenon, midazolam-induced anesthesia) and pathological (e.g., vegetative/unresponsive wakefulness syndrome, minimally conscious state) alterations of consciousness. TMS induces focal neuronal discharge at the cortex surface and EEG measures cortical electrical responses locally and at distance sites. In this way, single pulses TMS-EEG combined with a neuronavigation system allows to study cortical excitability and long range cortical effective connectivity with good spatio-temporal resolution.

Our previous studies showed that in unconscious states such as in non-rapid eye movement sleep, propofol anesthesia and unresponsive post-coma patients, TMS triggers a stereotypical slow wave that mostly remains local and short lasting. In conscious states like in normal wakefulness, in minimally conscious patients or when dreaming, brain activation patterns to TMS are widespread, differentiated and long lasting. The perturbational complexity index (PCI) was subsequently developed to quantify these brain responses, by calculating the spatial and temporal response of the brain to the TMS perturbation. PCI successfully differentiates between conscious and unconscious states, with a clear-cut difference at the individual level.

TMS-EEG is also sensitive to changes in the content of consciousness, within the range of wakefulness. Indeed, we could detect different changes in brain reactivity during meditation practices (open presence and self-induced cognitive opacity) and during cognitive trance. Local and global aspects of cortical reactivity can thus be willfully modulated. Anecdotally, TMS perturbation may also induce or suppress content of consciousness (e.g., induce phosphene in dreams and reduce the ability to remain in a trance state).

TMS-EEG is a great tool to study consciousness that does not depend on the integrity of sensory and motor pathways, bypasses subcortical and thalamic gates, and that does not require language comprehension nor active participation of subjects. It is a reliable diagnostic method for patients with disorders of consciousness after a coma, but the heavy and expensive setup as well as the need of strong expertise currently prevent its use in clinical routine. More work is needed to make TMS-EEG accessible to all.

Diego Hangartner

Diego Hangartner [b. 1962] completed his studies in pharmacology at the ETHZurich, specializing in psychopharmacology and addiction. His main interest is to understand what constitutes a healthy mind, and how to cultivate it. He lived for 11 years in Dharamsala, India, learned Tibetan, and studied for 7 years at the Institute of Buddhist Dialectics. He completed several retreats, worked as an interpreter, translating Tibetan into many languages, and published a few books. On returning to Europe in 2003, he taught widely, and organized several large events with His Holiness the Dalai Lama (Switzerland 2005, Hamburg 2007), and participated in research aimed at exploring the benefits of meditation as a long-term practitioner. Collaborations with many universities and research institutes, such as the 'Max Planck Institute', EPFL, University of Zurich, etc..

Diego is associated and worked with the Mind and Life Institute since the 1990's: he was Mind and Life's COO from 2009 – 2012 in the USA, co-founded Mind & Life Europe, and was its director until 2015. Diego founded the "Institute of Mental Balance and Universal Ethics" (IMBUE), an interdisciplinary initiative, to develop and provide tools and programs that foster mental balance. He created and teaches "The Wheel of Mental Balance", a methodology to cultivate a healthy and resilient mind. Diego is also a certified coach (CPCC, CTPC), working with individuals and teams with a special focus on fulfilment, flourishing and development.

Website: www.diegohangartner.org

The Subtle Mind: Essence and Interdependence

The Buddhist tradition has developed a wide range of practices and technologies to explore the mind and to cultivate healthy qualities of the mind such as wisdom, focus and compassion. Furthermore, the Buddhist lineages have created a huge body of philosophical, epistemological and methodological frameworks to explain the workings of the mind.

In my presentations I will provide practical tools for improving meditation, linking those practices to the framework of the twelve interdependent links - a key explanation of why ignorance lies at the root of an untrained mind, in turn leading to suffering, delusions, concepts, clinging and aversion.

I will also provide a framework for the reasons why Buddhist philosophy and practice speaks of different levels of mind - even the possibility of more subtle aspects that are not limited to biological functions.

Ilios Kotsou

Passionate about everything related to relationships, especially by the richness emotions give to our lives, Ilios Kotsou is active in the fields of emotional intelligence, organisational change and mindfulness. He holds a Master in Labour Sciences, is trained in brief therapy (Palo Alto model) and mindfulness (MBSR and MBCT). He has a phD in psychology from the Université Libre de Bruxelles. He worked for 4 years as a researcher at the Faculty of Psychology at UCL and remain involved in several universities (ULB Brussels, University of Savoie). Expert and trainer in the field of management, he worked for numerous Belgian and international organizations and has collaborated with Medecins Sans Frontières for the training of field coordinators. Author of several books including "Éloge de la lucidité", "Petit cahier d'exercices de pleine conscience" and " Psychologie positive : le bonheur dans tous ses états ," or " Change yourself, change the world", in collaboration with Matthieu Ricard, Jon Kabat- Zinn, Pierre Rabhi and Caroline Lesire. Ilios Kotsou is very interested in the interaction between basic science and field practice and is actively involved in Emergences (www.emergences.org) whose mission is to share knowledge in the areas of empathy, of altruism and mindfulness and fund humanitarian projects. His latest book "Éloge de la lucidité » was published by Robert Laffont. Meditator-activist, he puts his energy at the service of the link between inner transformation and social change.

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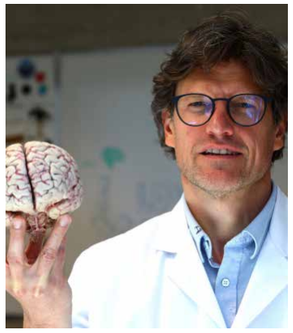
Different forms of meditation may share similarities and differences in different ways with Hypnosis, Trance and Psychedelics

Exploring similarities and differences between theses diverse states of consciousness implies addressing the question of the variety of forms of meditation, and the differences and similarities between this variety of forms themselves, and the other consciousness states. Attention can be seen a common feature of all meditative practices. Meditation states may vary by the type of attention they draw on: focused attention (on breath for mindfulness or on a mantra for transcendental meditation) or open monitoring. How are the other states of consciousness related to attentional processes?

The deliberate cultivation of attention seems to be at the core of most meditation practices while hypnosis, trance and psychedelics may involve automatic responses that are externally induced. However, auto-hypnosis also involves intentionality. What could be said about trance, hypnosis and psychedelics on the questions of 'training the mind'? Another question is about the suggestions that are present in hypnosis. Does guided meditations also imply a kind of suggestion? Several forms of meditation involve the awareness of the body and body sensations. What about the other consciousness states? Some meditative states invite to observe one's experience without adding any mental content, while some other forms of concentrative or visualizations meditations are more content based. Can the latter be seen as altered states of consciousness?

Many meditation practices are related to meta-awareness, as an awareness of one's own mental processes. De-automatization is therefore also a central theme of these meditative practices, both on its phenomenological or scientific accounts. As an example, it appears that meditation practices as mindfulness or choice less awareness lead to desactivation of the default mode network (related to automatic mind wandering) when transcendental meditation seems to be related to high activation of this mode. How do the other consciousness states relate to the question of meta-awareness and de-automatization? Compassion has a central place in several meditation practices (loving-kindness, caring mindfulness). Can it be considered as being a core feature of all meditation practices? What could be said about hypnosis, trance and psychedelics on that point?



Steven Laureys

Steven Laureys, MD PhD, FEAN, is a neurologist working at the Coma Science Group and GIGA Consciousness Research Unit of the University Hospital and University of Liège, Belgium. He is Research Director at the Belgian National Fund for Scientific Research. His team explores human consciousness and brain function in health and disease. Using the latest technological tools they study the workings of the mind in coma and related states (brain death, unresponsive wakefulness, minimally conscious and locked-in syndrome), near-death experiences, concussion, anesthesia, hypnosis, meditation, trance and dreamlike states. He has published over 400 scientific papers and 12 books and is founder and chair of the World Federation of Neurology and European Academy of Neurology Research Groups on coma and disorders of consciousness. The team of Professor Laureys is internationally recognized for their expertise in altered states of consciousness following severe brain injury. Patients are being admitted to their expert center from all over Europe.

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- Resting state networks and consciousness: alterations of multiple resting state network connectivity in physiological, pharmacological, and pathological consciousness States. Front Psychol. 2012 27; 3:295.
- Neurophysiology of hypnosis. Neurophysiol Clin. 2014 44(4):343-53.

Websites: http://www.coma.ulg.ac.be and www.comascience.org

Can science explain consciousness? Lessons from coma and related states

Understanding consciousness remains one of the greatest mysteries for science to solve. How do our brains work? Will we ever be able to read minds? How can we know if some patients in coma have any consciousness left and how could we communicate with them? What are near-death experiences? What is brain death? What happens in our brains during dreaming, hypnosis or meditation? At present, nobody understands how matter (our trillions of neural connections) becomes perception and thought.

We will here briefly review some neurological facts on consciousness and impaired consciousness. While philosophers have pondered upon the mind-brain conundrum for millennia, scientists have only recently been able to explore the connection analytically through measurements and perturbations of the brain's activity. This ability stems from recent advances in technology and especially from emerging functional neuroimaging and electrophysiology studies. The mapping of conscious perception and cognition in health (e.g., conscious waking, sleep, dreaming, hypnosis, meditation, trance, sleepwalking and anesthesia) and in disease (e.g., brain death, coma, near-death, "vegetative" unresponsive wakefulness, minimally conscious state, locked-in syndrome, seizures, hallucinations etc) is providing exiting new insights into the functional neuroanatomy of human consciousness. Our perception of the outside world (sensory awareness; what we see, hear, etc.) and our awareness of an inner world (self-awareness; the little "voice" inside that "speaks" to ourselves) seemingly depend on two separate "awareness" networks.

References:

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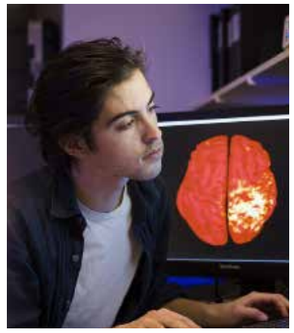


Michael Lifshitz

Michael is interested in the plasticity of human consciousness. His research investigates practices that aim to transform subjective experience—from meditation and hypnosis to placebos, prayer, and contemplative therapies. He works from an interdisciplinary perspective, combining cognitive, neurobiological, sociocultural, and phenomenological approaches to shed light on mechanisms of self-regulation in both health and pathology.

Michael completed his PhD in neuroscience at McGill University and is currently working with T. M. Luhrmann as a postdoctoral fellow in the department of anthropology at Stanford. His work has been supported by the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC), the Bial Foundation, and the Mind & Life Institute. Before his doctorate, he completed a master's in neuroscience and an undergraduate with honours in psychology and minors in philosophy and world religions, all at McGill.

Learning to hear voices: The phenomenology and mechanisms of tulpamancy

Most of us hear voices in our head all of the time. We ponder our decisions and ruminate over our mistakes, relive the conversations we've had and rehearse those we might hope to have. What is more unusual, however, is to have the sense that some of the voices in our head really don't belong to us. In our medicalized western culture, we usually think of this kind of "not me" experience as pathological, psychotic, or delusional. We tend to say that those who hear voices are mad. And yet, in many cultural contexts around the world, healthy people deliberately train their minds to surrender the feeling of agency over their own inner speech. Tulpamancy is an emergent internet-based community that revolves around rigorously training the imagination to cultivate friendly dialogues with invisible companions called "tulpas", or thought-forms. In this talk, I will describe preliminary findings from an ongoing multi-methods project that brings together phenomenological interviews, cognitive assessments, and functional neuroimaging to investigate the mechanisms of tulpamancy. This research illustrates how novel cultural forms can open new modes of subjectivity and pattern fundamental domains of human experience, right down to the basic feeling of agency over one's innermost private thoughts.

Romy Lorenz

I am a cognitive neuroscientist with a multidisciplinary background in psychology and biomedical engineering. I received my PhD in Neurotechnology from Imperial College London in 2017, for which I have developed a novel brain-computer interface combining real-time neuroimaging with machine-learning ("The AI Neuroscientist"). Currently, I am a Sir Henry Wellcome Postdoctoral Fellow at the University of Cambridge, Stanford University and the Max Planck Institute for Human Cognitive & Brain Sciences. My research vision lies in revisiting the classic taxonomy of cognitive processes and bringing forward a neurobiologically-derived cognitive taxonomy by fusing large-scale neuroinformatic tools (e.g., text mining and automated meta-analyses) and brain-computer interface technology at the subject level. This also involves thinking about novel efforts of how to advance explanatory insights into the causal network mechanisms that underlie cognition, for which I currently explore deep learning techniques and computational modelling. Equally, I am fascinated about studying altered states of consciousness (e.g., meditation and psychedelics) and am long-term collaborator of the Psychedelic Research group, led by Dr. Robin Carhart-Harris group at Imperial College London.

Website: www.romylorenz.com

Towards neuroadaptive technology for neurophenomenology

The classic taxonomy of cognitive processes is based on cognitive psychology theory and was developed largely blind to the functional organization of the brain. Therefore, classic cognitive tasks tend to tap multiple cognitive processes that involve multiple brain networks. Resolving this many-to-many mapping problem between cognitive tasks and brain networks is practically intractable with standard functional magnetic resonance imaging (fMRI) methodology as only a small subset of all possible cognitive tasks can be tested. This is problematic, as studying only a fraction from the large space of cognition has resulted in over-specified inferences about functional-anatomical mappings with a misleadingly narrow function being proposed as the definitive role of a network, concealing the broader role a network may play in cognition.

Here, I present an alternative approach that resolves these problems by combining real-time fMRI with a branch of machine learning, Bayesian optimization. Neuroadaptive Bayesian optimization is a powerful strategy to efficiently explore more experimental conditions than is currently possible with standard methodology in a single individual. I will present results from a study where we used this method to understand the unique contributions of two frontoparietal networks in cognition. Our findings deviate from previous meta-analyses and hypothesized functional labels for these networks. Using this approach, I aim to bring forward a neurobiologically-derived cognitive taxonomy; an important step also for making further progress in understanding the changes in network function associated with altered states of consciousness.

Building up on these results, in a recent proof-of-principle study with 14 stroke patients, we demonstrate that the approach can be applied to reliably identify (dys-)functional profiles of a frontoparietal network on a subject-level basis.

In addition to providing a new way to study inter-individual differences in cognition, neuroadaptive approaches have the potential to advance the study of experiential states in meditation, psychedelics and hypnosis within the framework of neurophenomenology by linking neural (third-person perspective) and experiential-phenomenological (first-person perspective) states.

Antoine Lutz

Dr. Antoine Lutz is a director of research at the French Medical Research Institute (INSERM) in the Lyon Neuroscience Research Center (CNRL). He did his PhD in cognitive neurosciences in Paris, France, with Francisco Varela an EEG neurophenomenological study of attention. During his postdoctoral work with Richard Davidson, at the University of Madison-Wisconsin, he pioneered the neuroimaging study of meditation practices in expert meditators and in novices who learnt to meditate using the Mindfulness-Based Stress Reduction program (MBSR). MBSR is a secular meditation intervention routinely used in hospitals in the North-America and Europe. In 2008, Richard Davidson and him were awarded a NIH-NCCAM grant to fund in Madison the first American Center of Excellence on Research dedicated to neurophysiological study of meditation

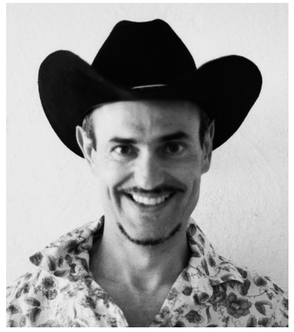
practices. After working for ten years in the US as a research scientist, he joined the Lyon Neuroscience Research Center in France in January 2013. His current research group focuses on investigating the neurophysiological basis of mindfulness and compassion meditations and their impact on consciousness, attention and emotion regulations, and pain perception as measured by cognitive, affective and social neuroimaging paradigms using EEG, MEG, intra-cortical EEG, and fMRI. This research is currently funded by an European ERC consolidator grant (Brain&Mindfulness, 2014-2019). He also collaborates to a European research consortium investigating the impacts of meditation practices on ageing and well-being as measured by brain imaging (PET, IRMf, DTI, EEG), biomarkers of ageing, and psycho-affective and cognitive behavioural measures (Meditageing, H2020, 2016-2021, study coordinated by Gaël Chételat, INSERM Caen). He recently started a collaboration investigating the neurocomputational principles of meditation (ANR MindMadeClear, coordinated by Hugues Mounier, CNRS, Supélec, Paris).

Website: https://crnl.univ-lyon1.fr/index.php/fr/Accueil/ERC-Brain-Mindfulness-A.-Lutzm

Dual and non-dual mindfulness meditation during pain

In this presentation, I will first present a conceptual framework mapping various styles of mindfulness-related practices along specific phenomenological dimensions. In particular, I will distinguish between the so-called dual and non-dual mindfulness meditations.

I will then use this framework to interpret a recent experimental study on the cognitive mechanisms of pain regulation in mindfulness meditation in expert and novice meditators. Finally, I will speculate on the possible use of this framework to explore the similarities and differences between mindfulness meditations and hypnosis.



Giuseppe Pagnoni

Giuseppe Pagnoni is Associate Professor at the Department of Biomedical Sciences, University of Modena and Reggio Emilia, Italy. After a Master in Physics, he completed a PhD in Neuroscience and has worked for several years in the Department of Psychiatry and Behavioral Sciences, at Emory University, Atlanta (GA), USA. He has led and collaborated to neuroimaging studies on diverse topics including reward processing, the interaction of immune and brain function, social cognition, intrinsic brain activity, pain processing, mental effort, meditation. He is currently interested in the application of the predictive coding framework to the study of contemplative practices.

Living in the present, seeing things as they are, and the empty mind: our favorite "contemplatitudes" through the lenses of predictive coding

Predictive coding, especially in the free-energy minimization principle formulation by Karl Friston, is a recent theoretical framework with a potentially unparalleled explanatory power in neuroscience. In this talk, I will present some reflections and insights inspired by the adoption of such perspective for the study of contemplative practice. I believe that this holds great potential for advancing our understanding of the mechanisms of action of meditation, where both traditional notions and phenomenological accounts come to be seen under a novel light. It is my hope that this brief introduction will help stimulating further interest and discussions.

Claire Petitmengin

After studies in Buddhist philosophy and ten years of experience in information system design, Claire Petitmengin, completed her PhD thesis under the supervision of Francisco Varela at the Ecole Polytechnique in Paris, on the subject of the lived experience that accompanies the emergence of an intuition. She is presently Professor Emerita at the Institut Mines-Télécom and member of the Archives Husserl (Ecole Normale Supérieure) in Paris.

Her research focuses on the usually unrecognized dynamics of lived experience and "micro-phenomenological" methods enabling us to become aware of it and describe it. She studies the epistemological conditions of these methods, as well as their contemplative, educational, therapeutic, and artistic applications. She has written numerous scientific articles and two books: L'expérience intuitive, *and* Le chemin du milieu: Introduction à la vacuité dans la pensée bouddhiste indienne. *She also edited* Ten years of viewing from within: The legacy of Francisco Varela, *which commemorates the tenth anniversary of the publication of* The View from Within, *wherein Francisco Varela designed the foundations of a research program on lived experience.*

Website: http://www.clairepetitmengin.fr/ and http://www.microphenomenology.com

Fabienne Picard

Dr Fabienne Picard is a neurologist. She is currently Senior consultant in the EEG and Epilepsy Unit of the Neurology Department at the University Hospital of Geneva. She holds a MD degree in medical studies in Neurology as well as a Diploma of Advanced Studies (DEA) in Cellular and Molecular Biology, with a major in neurobiology, from the Faculty of Medicine of Strasbourg, France. In 1995 she joined the University Hospitals of Geneva where she obtained a title of privat-docent and senior lecturer at the Faculty of Medicine of Geneva. Internationally renowned in the field of epilepsy genetics, she has published about 80 articles in peer-reviewed journals. Over the last few years, she has been particularly interested in the role of the insula in self-awareness and positive emotions through the study of "ecstatic" epilepsy.

Epilepsy and ecstatic experiences

While epilepsy is classically associated with loss of consciousness, there is a form of focal epilepsy, i.e. related to an epileptic discharge starting in one region of one hemisphere, manifesting by a sense of certainty, a feeling of bliss and a sense of timelessness, without loss of awareness of the external world. This state seems to correspond to an extreme in the moment present centeredness and may thus mimic some states induced by meditation. In addition to the ecstatic aura (beginning of the seizures), the patients may suffer from secondary tonic-clonic seizures.

The study of patients suffering from this type of epilepsy may help to better understand the neural network implied in present moment awareness and sense of being in an eternal now. We could

show that the ecstatic symptoms are related to a brain network which includes the dorsal anterior insula, which is known to process interoception. Some patients had an increased blood flow within the anterior insula during the seizures (ictal SPECT- single photon emission computed tomography). We could reproduce the ecstatic symptoms by the electrical stimulation of the insula in other patients who were implanted for a pre-surgical evaluation of their drug-resistant ecstatic epilepsy. Connectivity studies showed that the dorsal anterior insula is the leading structure of a network responsible for the ecstatic symptoms.

In the concept of the brain functioning as a « predictive machine », we hypothesize that the ictal discharge within the insula prevent it to generate the prediction errors in the field of interoception, which are usually constantly produced in response to the real internal incoming signals (from the inside of the body), modulated and contextualized by the external signals from external world.

Pierre Rainville

Pierre Rainville, Ph.D., is trained in Biology, Neuropsychology and Neuroscience, and is currently full Professor at the Faculty of Dentistry of the Université de Montréal, and director of the Laboratory of Neuro-Psycho-Physiology of Pain (LaNeP3) at the « Centre de recherche de l'Institut universitaire de gériatrie de Montréal » (CRIUGM). Research methods used in his lab include psychophysics, psychophysiology, and brain imaging. His research focuses primarily on brain mechanisms underlying acute pain perception and pain communication and examines the effects of attention, emotion, expectation, empathy, and learning & memory. This work is relevant to non-pharmacological interventions for pain relief, including hypnosis, placebo, meditation, music, etc., and to the understanding of biopsychosocial risk factors (e.g. stress) that contribute to chronic pain.

Website: https://www.researchgate.net/profile/Pierre_Rainville
https://scholar.google.com/citations?user=tjPuHTwAAAAJ&hl=fr
https://www.ncbi.nlm.nih.gov/pubmed?cmd=search&term=Rainville+P

Pavlov meets the Zen brain: Insights on the effects of mindfulness on pain, fear, and suffering

Pain is an aversive experience signaling an immediate threat to the body and involving distributed brain networks underlying immediate perceptual, affective, cognitive, physiological and behavioral responses, as well as associative processes underlying secondary cognitive-affective elaborations. The adaptive aversive function of acute pain may further generalize through fear-learning mechanisms allowing for the prediction of future pain. Mindfulness-based meditation has been associated with a reduction in pain sensitivity and with a modification of pain-related brain responses. Such changes may lead us to predict a reduction in fear-learning driven by pain. However, recent psychophysiological studies from our laboratory suggest that learning processes allowing for the generation of valid predictions of pain occurrence are preserved in experienced meditators along with basic protective (reflexive) responses to the noxious input. In contrast, the hyperalgesic effects of fear-learning were reduced or blocked in meditators. This is consistent with the notion that the first arrow of pain triggers adaptive responses, including associative learning processes underlying valid pain prediction, and that mindfulness practice may help protect against the second arrow involving the maladaptive anticipation, elaboration and rumination underlying pain suffering. This basic research may help delineate the alleged benefits of mindfulness-based interventions and improve our understanding of the underlying mechanisms.

Andreas Roepstorff

Andreas Roepstorff is a professor in cognition, communication and culture at the department of Culture and Society and the department of Clinical Medicine at Aarhus University, Denmark. He works at the interface between anthropology, cognitive science and neuroscience, ans is equally interested in the workings of the mind and brain, and in how cognitive science and brain imaging, as fields of knowledge production, relate to other scientific and public fields. He has formal training in social anthropology and in neurobiology and has published both within these disciplines as well as in various collaborations across other fields.

He is the director of the Interacting Minds Centre at Aarhus University and is involved in a number of transdisciplinary collaborations, focusing on aspects of human interaction. He has a long-standing research interest in cognitive aspects of contemplative practices.

Tania Singer

Tania Singer is Professor and head of the Social Neuroscience Lab of the Max Planck Society in Berlin. After completion of her psychology studies at the Technical University in Berlin in 1996, Tania Singer received her PhD in Psychology at the Max Planck Institute for Human Development in Berlin in 2000. Thereafter, she became a Post-doctoral Fellow at the same institution, at the Wellcome Department of Imaging Neuroscience, and at the Institute of Cognitive Neuroscience in London. In 2006, she went to the University of Zurich as Assistant Professor and became later Inaugural Chair of Social Neuroscience and Neuroeconomics and Co-Director of the Laboratory for Social and Neural Systems Research. From 2010 to 2018 she was Director of the department of Social Neuroscience at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig.

Her research focus is on the investigation of human sociality and social emotions such as empathy and compassion. She is founder and principal investigator of the ReSource project, a large-scale longitudinal study on the effects of mental training on brain plasticity, mental and physical wellbeing and prosocial behaviour. She further holds a cooperation with the macro-economist Prof. Dennis Snower on the topic of Caring Economics. In the context of her long-time membership at the Mind and Life Institute, she helped organize together with Matthieu Ricard two large-scale conferences with the Dalai Lama in 2010 in Zürich on "Caring Economics" and in 2016 in Brussels on "Power and Care" with two resulting book publications respectively.

Website: https://www.social.mpg.de/2766/en

Meditation: A Method to Alter States of Consciousness, Change Traits or Shift your Way of Being?

In my short talk, I will explore how much contemplative sciences so far can tell us about how different types of meditation techniques can alter states of consciousness, change psychological traits or even our whole way of being. I will discuss the importance of embedding meditation in a compassion-based and ethical framework and finish with pointing out some of the short-comings of current research.

Corine Sombrun

Corine Sombrun grew up in Africa and returned to France to study musicology, piano and composition. She settled in London in 1999 as a musician but also undertook projects for the BBC World Service.

One of those reports (2001) took her to Mongolia, where a highly respected Dahrad *shaman recognized her as having unique shamanistic capabilities. She was invited to spent several months a year at the border with Siberia to undertake the rigorous training to become a Shaman. After eight years she thus became the first Western woman fully trained in the Mongolian shamanic tradition. Her unique experience in the practice of shamanic trance and her ability to self-induce it have been a topic of interest for scientists. She has been collaborating with researchers since 2006, in order to show that this shamanic trance indeed modifies the circuits of cerebral functioning (Flor-Henry et al. 2017)*
Further research into it, including in the capacity of any human being to reach such a state in a self-induced way, lead her to develop with E. Le Quéméner (Research Expert, INRA, France) Cognitive Trance Training, *a sound-loop based program to help people experience a trance state and teach them how to self induce it. Tested in various research settings and workshops, a 80% average of the people underwent a trance state. It opens door to inducing trance to non-trained people as a means to discover some of the neurologic processes at work during the induction. New researches are under way in Belgium with Steven Laureys at Liege University.*

Corine collaborates extensively with artists, by leading workshops exploring the influence of trance on creativity (e.g. at the Ecole Nationale Supérieure des Beaux-Arts in France) and more recently with the HEC Paris Executive Education by leading Cognitive Trance Training programs. She has written several books translated into many languages, including In Geronimo's footsteps*,* Les esprits de la steppe *and* Mon initiation chez les Chamanes *(in the process of being adapted for cinema).*

Website: www.corinesombrun.com

Cognitive trance, a universal human potential inherited from shamanic heritage - The most recent data of neuroscientific studies of cognitive trance states.

Cognitive Trance, a state of consciousness stemming from shamanic practices, has been established by C. Sombrun as being accessible, by and large, by most humans. Processes to induce trance are related to acoustic effects, but though extracted for drum records, do not contains the main rhythmic characteristics supposedly irreducible to trance induction. Understanding the activity of brain leading to a specific state of mind has been C. Sombrun search for some time. She collaborated with neuroscientists who eventually demonstrated cognitive trance not to be neither a pathologic state nor a trasvesty of spiritual state. It is the purpose of this oral to present the most recent neuroscientific data of such trance state recorded at different places and explain the main trends of these observations. Such states, very diverse, cover a large score of brain correlated to mind states that can be compared to previous analyses of other trance states. It can be deduced that cognitive trance states are generating, on laymen, a wide variety of brain/mind states without altering their behavior and with full reversibility. It appears to be a valuable neuroscientific tool to study functional brain and its mind correlated functions.

Keisuke Suzuki

Keisuke Suzuki obtained his Ph.D in Artificial Life from the University of Tokyo in 2007. He stayed as a research fellow in RIKEN Brain Science Institute, working on human cognitive functions in virtual reality environments (2008-2011). Here, with his colleagues, he developed a novel virtual reality system called Substitutional Reality. In this setup, people believe they are experiencing real-world scenes even though they are just exposed to pre-recorded ones. In 2011 he joined the Sackler Centre for Consciousness Science at the University of Sussex as a post-doctoral research fellow.

Keisuke's research focuses on the study of consciousness in terms of embodied cognition, investigating ideas like body ownership, feeling of agency, sense of presence, etc. His approach builds on state-of-the-art virtual reality setups for the study of conscious presence and the bodily-self, complemented by theoretical modelling of embodied self-consciousness. Recently, his work has extended to the study of hybrid setups, combining Virtual Reality and Artificial Intelligence, opening to new ways of studying human perception, cognition, and consciousness.

Hallucination Machine: A Virtual Reality Platform for Studying Altered Perceptual Phenomenology

Altered states of consciousness, such as psychotic or pharmacologically-induced hallucinations, provide a unique opportunity to examine the mechanisms underlying conscious perception. Virtual reality has been used for simulating such atypical experiences (e.g. the out-of-body experience), employing its multisensory and immersive nature. In this talk, I will introduce a new virtual reality platform, the Hallucination Machine, which comprises a novel combination of two powerful technologies: deep convolutional neural networks (DCNNs) and 'substitutional reality'. Specifically, we apply bespoke visualisation methods for DCNNs to panoramic video, with the resulting footage viewed immersively through a head-mounted display. By doing this, we are able to simulate visual hallucinatory experiences in a biologically plausible and ecologically valid way. The Hallucination Machine offers a valuable new technique for simulating altered phenomenology without directly altering the underlying neurophysiology.

Francis Taulelle

Francis Taulelle started his research career after studying at the Ecole Normale Supérieure of Cachan and Orsay University, France. CNRS Researcher, he specialized in investigating crystallization, and crystal structure of materials by using Magnetic Resonance Spectroscopy (MRS/NMR) and is the founder of NMR crystallography. He has been

working in a variety of laboratories (Paris, Orléans, Strasbourg, Versailles in France) setting up NMR facilities and published more than 300 scientific articles. He is CNRS research Director emeritus, and Professor at KU Leuven, physical-chemist of materials and Scientific advisor of the NMR center.

Since 2012 he collaborates with Corine Sombrun, in order to contribute to understanding the state of consciousness occurring during her trances issued from shamanic traditions and those induced by a sound-loop based program, called Cognitive Trance Training to help people experience a trance state and teach them how to self induce it: 80% of people succeed in entering a trance state, a way to discover neurologic processes at work during induction and trance. Francis Taulelle is now president of "TranceScience" the funding structure of TranceScience Research Institute, the mission of which is to bridge traditional modulation of consciousness and its neuroscientific characterization.

Cognitive trance, a universal human potential inherited from shamanic heritage - The most recent data of neuroscientific studies of cognitive trance states

Cognitive Trance, a state of consciousness stemming from shamanic practices, has been established by C. Sombrun as being accessible, by and large, by most humans. Processes to induce trance are related to acoustic effects, but though extracted for drum records, do not contains the main rhythmic characteristics supposedly irreducible to trance induction. Understanding the activity of brain leading to a specific state of mind has been C. Sombrun search for some time. She collaborated with neuroscientists who eventually demonstrated cognitive trance not to be neither a pathologic state nor a trasvesty of spiritual state. It is the purpose of this oral to present the most recent neuroscientific data of such trance state recorded at different places and explain the main trends of these observations. Such states, very diverse, cover a large score of brain correlated to mind states that can be compared to previous analyses of other trance states. It can be deduced that cognitive trance states are generating, on laymen, a wide variety of brain/mind states without altering their behavior and with full reversibility. It appears to be a valuable neuroscientific tool to study functional brain and its mind correlated functions.

Christopher Timmermann

Christopher Timmermann obtained a BSc in Psychology in Santiago, Chile and a MSc in Cognitive Neuroscience at the University of Bologna in Italy. He is currently completing a PhD in Imperial College London, leading a project focusing on the effects of psychedelic compound DMT in the human brain and experience. He is interested in the use of methods bridging the relationship between experience and changes in brain activity in non-ordinary states of consciousness, as well as the impact of psychedelics at different temporal and spatial scales, both within and between individuals.

A neurophenomenological approach for the study of non-ordinary states of consciousness using DMT

The use of second-person approaches provides a unique opportunity to understand the trajectories the mind-body systems may take when undergoing transitions of consciousness states such as wake-sleep, disruptions in self-related processing, contemplative practices and psychedelic states. DMT is a serotonergic psychedelic known for inducing rich experiences characterised by feelings of deep immersion into subjectively-felt alternate 'realities' or 'dimensions". In our research we studied the effects of DMT in humans by using a multimodal brain imaging approach combined with a range of measures of subjective effects inspired in a neurophenomenological approach. Results reveal a close relationship between different measures of brain activity and dynamic shifts in different dimensions of conscious experience. Our findings indicate the potential relevance of using DMT in the context of consciousness research as well as providing proof-of-concept methods for the use of second-person approaches in the study of non-ordinary states of consciousness.

Audrey Vanhaudenhuyse

Audrey Vanhaudenhuyse is a neuropsychologist, PhD in Medical Sciences. She is interested in consciousness, altered (e.g. coma, unresponsive wakefulness syndrome, minimally conscious sate) and modified (e.g. hypnosis, trance) states of consciousness processes. She is currently working in the Algology Department of the University Hospital of Liège and she is heading the Sensation and Perception Research Group of the GIGA Consciousness of the University of Liège. The aim of her clinical researches is developing paradigms to evaluate the benefit on global well-being, sleep difficulties and cognitive complains of hypnosis/self-care learning as well as virtual reality in different pathologies (chronic pain patients, patients in oncology, patients in intensive care units, etc). With functional magnetic resonance imaging and high-density electroencephalography, she is also studying the neurophysiological mechanisms of hypnosis and other modified states of consciousness in healthy subjects and patients.

Website: https://www.gigaconsciousness.uliege.be

Modification of self-awareness in hypnosis

During the normal wake state, a negative correlation between external (environment) and internal (self) awareness has been observed in healthy volunteers. Increased intensity of internal awareness reports have been related to increased connectivity in the default mode network, whereas increase in external awareness has been associated with increased connectivity in the external control network. We will present how the neuronal and behavioral counterparts of awareness are modified during hypnosis as compared to normal wakefulness. We also propose to discuss our last high-density-EEG results on hypnotic state. Finally, we will present a new way to disentangle highly hypnotizable from low hypnotizable subjects. This new way of measurement is useful, especially in clinical research, since it is challenging to define the level of hypnotizability of patients. Indeed, current standardized scales of hypnotizability are 45 to 90 minutes longer, and are not easily applicable in clinical practice.

Marieke van Vugt

Marieke van Vugt is an assistant professor in the Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence at the University of Groningen.

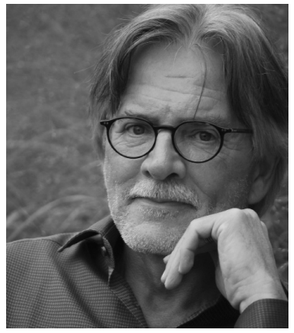
Her research aims to understand how, when, and why we mind-wander. She uses a multimodal approach that combines computational modeling, scalp and intracranial EEG, behavioral studies,

and eye-tracking. In addition, she is interested in how meditation practice affects our cognitive system, and she investigates meditation in both Western practitioners and Tibetan monks. She became a member of the Young Academy of Groningen in 2017.

Website: mkvanvugt.wordpress.com

Using computational models as a comparative framework to describe the cognitive and emotional processes in meditation and other practices

While the practice of meditation is very simple, understanding its effects on the mind is actually quite complex. To begin to understand the effects of meditation, and how those are similar and different from those of psychedelics, hypnosis, and trance, I think it is important to use computational modeling. Computational models are very useful in this context, because those can use a uniform language in which the different practices can be expressed. I will explain how our initial cognitive modeling of the meditation process was able to explain meditation-related improvements on two different attention tasks. I will then speculate about how changes in emotional processing can be modeled, and how cognitive models could explain similarities and differences between meditation, psychedelics, hypnosis, and trance.



Franz X. Vollenweider

Dr. Franz X. Vollenweider is currently Co-Director of the Center for Psychiatric Research, Director of the Neuropsychopharmacology and Brain Imaging Unit, and Professor of Psychiatry in the School of Medicine, University of Zurich. He is also the Director of the Heffter Research Center Zürich for Consciousness Studies (HRC-ZH), which he founded in 1998 and incorporated in his research group.

Dr. Vollenweider received his MD degree at the University of Zurich. He completed his doctoral thesis in experimental medicine at the Institute of Toxicology of the University and ETH of Zurich, was trained in neurochemistry at the Brain Research Institute of the University of Zurich, and in neuroimaging at the PET Centre of the PSI-ETH. In 1994 he became certified in the specialities of psychiatry and psychotherapy. His research interests encompass the area of psychopathology, cognitive neuroscience, and behavioural psychopharmacology of psychotic and affective disorders.

Current research focuses on the investigation of the functional networks and transmitter dynamics underlying the experience of self, visual perception, cognitive and emotional processes and the dysfunctions of these processes in human models of psychoses and psychiatric patients. Multiple approaches including measures of information processing, event-related potentials, and brain imaging techniques are used for studying these functions.

Website: https://www.dppp.uzh.ch/en/research/psychiatric/neuropsychopharma/brainimaging.html

Phenomenology and prediction of acute and sustained response to psychedelic psilocybin in mediation experts in a mindfulness group retreat

Meditation and psychedelics have played key roles in humankind's search for self-transcendence and altered consciousness. However, neither their possible synergistic effect, nor related state and trait predictors have been experimentally studied. To elucidate these issues, we administered double-blind the psychedelic drug psilocybin (315 µg/kg PO) or placebo to expert meditators (n = 39) during a 5 day mindfulness group retreat. Psilocybin increased meditation depth and incidence of positively experienced self-dissolution, with no concomitant anxiety.

Openness, optimism, mediation depth, and emotional reappraisal were predictors of the acute response. Compared with placebo, psilocybin enhanced post-intervention mindfulness and produced larger positive changes in psychosocial functioning at 4 month follow-up, which were mediated by the self-dissolution. These findings highlight the interaction of non-pharmacological and pharmacological factors, and the role of emotion/attention regulation in shaping the experiential quality of deep psychedelic states, as well as the experience of selflessness as a modulator of behavior and attitudes.

Patrik Vuilleumier

Patrik Vuilleumier is a neurologist and professor of neuroscience at the Medical School of University of Geneva and Campus Biotech. He specialized in behavioral neurology, neuropsychology, and neuroimaging with functional MRI and EEG. His work focusses on brain circuits of cognitive and affective processes, including attention, vision, and social emotion perception, as well as their disturbances due to neurologic or psychiatric illnesses. He conducted numerous studies on behavioral effects and neuroanatomical substrates of both conscious and non-conscious processes in perception, particularly in relation to spatial neglect and blindsight after brain lesion, emotion recognition and emotion regulation, as well as neural mechanisms responsible for disorders in self-awareness associated with hypnosis and functional/psychogenic neurological disorders (hysteria).

Website: https://www.unige.ch/medecine/neuf/en/research/grecherche/patrik-vuilleumier/

Brain networks underlying the generation, distortion, and loss of perceptual awareness

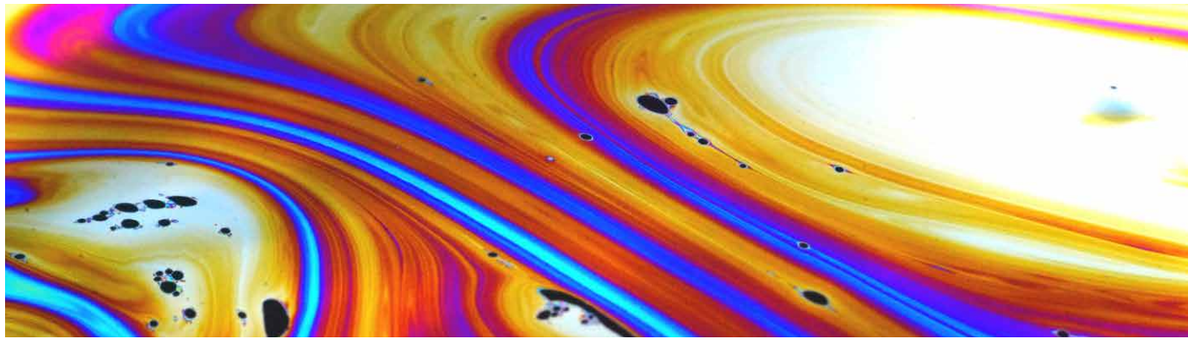
Our research investigates neural mechanisms subserving normal conscious awareness and its impairment in various situations with both healthy individuals and brain-damaged patients. From visual perception and attention studies, we study how sensory processing in low-level cortical areas is modulated by top-down signals related to goal-directed attentional processes or other (e.g. affective or motivational signals). We find that such top-down signals can amplify activity along sensory pathways, while their loss after lesions in fronto-parietal attention networks may reduce

(in low-level areas) or even abolish (in higher level areas) neural responses to incoming sensory information. This work allows not only better understanding of neuropsychological disorders associated in disorders in perceptual awareness, such as spatial neglect, but also offers novel way to regulate and restore awareness through various approaches, including real-time neurofeedback to boost residual non-conscious activity in sensory pathways. In other studies using hypnosis in healthy individuals, we find that perceptual or motor functioning can be impaired by hypnotic suggestions through a distinctive modulation of corresponding brain areas, and link these effects to top-down influences from higher level areas in both attention and memory-related systems. This may in turn help understanding not only hypnosis but also psychiatric conditions associated with abnormal subjective experience of movement or perception, such as functional neurological symptoms (conversion). Altogether, these data converge with the notion that conscious experience is shaped by an integration of bottom-up, physically-driven and top-down, internally-generated signals in the brain.

Holger Yeshe

Born in Nürnberg, Germany, Holger Yeshe began practicing Buddhism in 1999. Since that time, he has studied and practiced extensively in both the Theravadan and Tibetan Buddhist lineages. In 2005, he met his main teacher, Yongey Mingyur Rinpoche with whom he has practiced with ever since. During his two decades of intensive study and practice, Holger Yeshe became fluent in Tibetan language and now serves as primary interpreter for Khenpo Kunga, Mingyur Rinpoche's main Khenpo. In 2010, he ordained as a novice Buddhist monk under the tutelage of Mingyur Rinpoche, splitting his time between monastic settings in Asia and Dharma centers in the West.

Holger Yeshe has a particular interest in the intersection between the meditative arts and western Scientific modes of inquiry. In 2018, Holger Yeshe attended his first Mind & Life Europe Summer Research Institute which he believes is a great place to continue to explore this dialogue. He currently helps co-direct Tergar Germany, offering meditation seminars in both English and German, coordinating community outreach, and providing individual instruction for students of Mingyur Rinpoche.



Schedule

ENCECON Workshop

Schedule	Tuesday, 11 June 2019	Wednesday, 12 June 2019	Thursday, 13 June 2019	Friday, 14 June 2019	Saturday, 15 June 2019
Time	**Arrival & Welcome**	**Theme: Consciousness**	**Theme: Self**	**Theme: States vs Traits, Ethical Values**	**Wrap-up & Departure**
07:45–08:30		**Meditation** Diego Hangartner	**Meditation** Holger Yeshe	**Meditation** Diego Hangartner	**Meditation** Holger Yeshe
08.30–09.30		*Breakfast*	*Breakfast*	*Breakfast*	*Breakfast*
09:30–11.00 *09:30–09.40* *09:40–09:50* *09:50–10:00* *10:00–10:10* *10:10–10:20* *10:20–10:30* *10:30–11:00*		**Morning Session I** Franz Vollenweider (psychedelics) Marie-Elisabeth Faymonville (hypnosis) Steven Laureys (noc*/coma science) Antoine Lutz (meditation) Corine Sombrun & Francis Taulelle (cognitive trance, 20 min) Group Discussion	**Morning Session I** Olaf Blanke (noc*/embodiment) Quinton Deeley (hypnosis) Marieke van Vugt (meditation) Michael Lifshitz (meditation/hypnosis) Romy Lorenz (real-time fMRI methods Rael Cahn (psychedelics & meditation) Group Discussion	**Morning Session I: States vs Traits** Tania Singer (contemplative practices) Elena Antonova (meditation) Thorsten Barnhofer (MBI for depression) Prisca Bauer (meditation/hypnosis) Fabienne Picard (epilepsy) Contemplative View by Diego Hangartner Group Discussion	**Morning Session I** Group Discussion on publishing workshop proceedings and theoretical manuscript
11:00–11:30		*Coffee/tea break*	*Coffee/tea break*	*Coffee/tea break*	*Coffee/tea break*
11:30–13:00 *11:30–11:40* *11:40–11:50* *11:50–12:00* *12:00–12:10* *12:10–12:20* *12:20–12:30* *12:30–13:00*		**Morning Session II** Giuseppe Pagnoni (meditation) Pierre Rainville (meditation) Christopher Timmerman (psychedelics) Olivia Gosseries (noc*/coma science) Contemplative View by Diego Hangartner (20 min) Group Discussion	**Morning Session II** Patrik Vuilleumier (noc*) Audrey Vanhaudenhuyse (hypnosis) Ilios Kotsou (meditation) Keisuke Suzuki (VR psychedelics) Contemplative View by Holger Yeshe (20 min) Group Discussion	**Morning Session II** Patrik Vuilleumier (noc*) Audrey Vanhaudenhuyse (hypnosis) Ilios Kotsou (meditation) Keisuke Suzuki (VR psychedelics) Contemplative View by Holger Yeshe (20 min) Group Discussion	**Morning Session II** Group Discussion on collaborative grant applications
13:00–14:30		*Lunch*	*Lunch*	*Lunch*	*Lunch and departure*
14.30–16.00		**Afternoon Session I:** 1st Person Methods Workshop Claire Petitmengin	**Afternoon Session I:** Hypnotic Induction & Debrief Marie-Elisabeth Faymonville	**Afternoon Session I:** Hypnotic Induction & Debrief Marie-Elisabeth Faymonville	
16.00–16.30		*Coffee/tea break*	*Coffee/tea break*	*Coffee/tea break*	
16.30–17.30	Arrival & registration	Methodological brainstorming session	Methodological brainstorming session	Methodological brainstorming session	
17.30–18.00		*Break*	*Break*	*Break*	
18.00–19.30	*Dinner*	*Dinner*	*Dinner*	*Dinner*	
20.00–22.00	**Welcome remarks by** Elena Antonova, Tania Singer and Steven Laureys Blitz Introductions (2 min/participant)	**Evening Session:** Cognitive Trance & Debrief Corine Sombrun and Francis Taulelle	**Evening Session:** Cognitive Trance & Debrief Corine Sombrun and Francis Taulelle	**Evening Session:** Cognitive Trance & Debrief Corine Sombrun and Francis Taulelle	

*noc = neuroscience of consciousness

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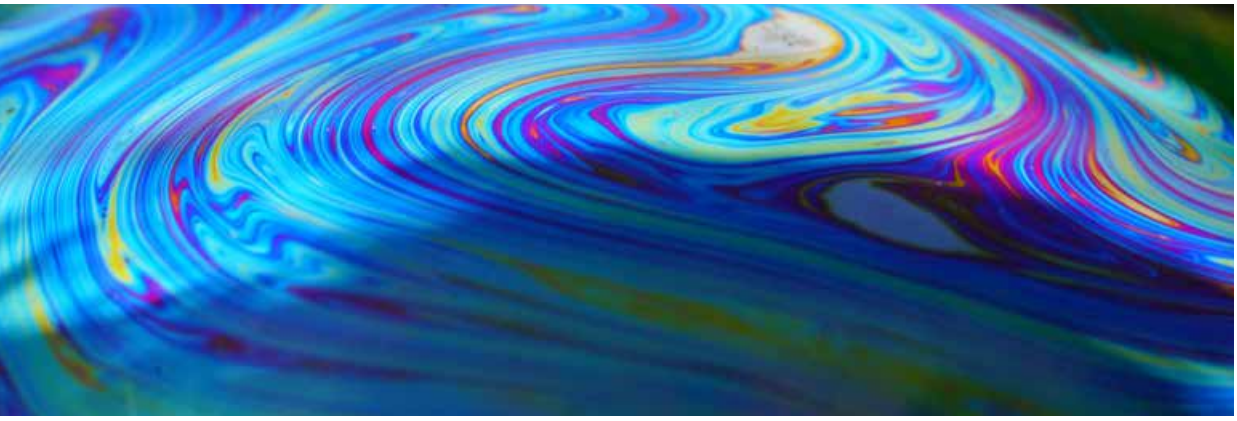

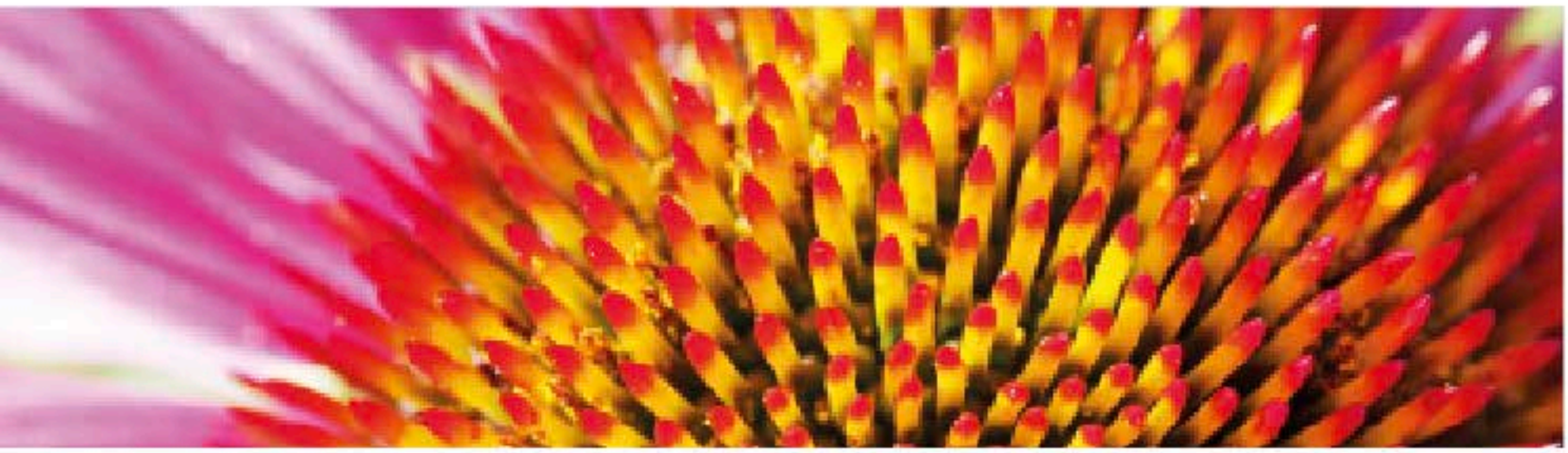

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