



Royal College of Psychiatrists

Neuroscience Spring Conference:
'The future of Psychiatry and Neuroscience'

26 March 2021

Conference Booklet

Contents	Page
General information	3
Presentation abstracts and biographies	4

General Information

Accreditation

This conference is eligible for up to 3.5 CPD hours, subject to peer group approval.

Certificates

Certificates of attendance will be emailed to delegates after the conference.

Feedback

A detailed online feedback form can be found by visiting

All comments received remain confidential and are viewed in an effort to improve future meetings.

Social Media

If you wish to tweet about the conference use @rcpsych #GENeuro

Conference Resources

Please see the following link to access the [conference resources](#) webpage.

Speaker abstracts and biographies

Introduction & Welcome

Professor Wendy Burn, Co-Chair, RCPsych Gatsby/Wellcome Neuroscience Project, Royal College of Psychiatrists

Professor Wendy Burn CBE, BM, MMedSc, FRCPsych was appointed as a Consultant Old Age Psychiatrist in Leeds in 1990 and now works part-time in a community mental health team for older people and as the National Mental Health Clinical Advisor to Health Education England. She has been involved in the organisation and delivery of postgraduate training since she started as a consultant. She has held many roles in education. She set up the Yorkshire School of Psychiatry and was the first Head of School.

She was Dean of the Royal College of Psychiatrists from 2011 to 2016 and President from 2017 to 2020.

She is currently Co-chair of the Gatsby Wellcome Neuroscience Project which focuses on modernising the neuroscience taught to psychiatric trainees. She is also Chair of the Clinical group of Equally Well, a project set up to improve physical health in people with a serious mental illness, and leads the Expert Group on COVID-19 Care for People with Mental Illness for the World Psychiatric Association.

The power of behaviour to reveal vulnerability to stress-related disorders and underlying neural mechanisms

Professor Carmen Sandi, Director, Laboratory of Behavioral Genetics, Brain and Mind Institute École Polytechnique Fédérale de Lausanne, Switzerland

Behaviour is the result of the interplay between environmental influences and brain structure and function. Accordingly, understanding behaviour may be a great tool to advance knowledge on processes and mechanisms underlying psychiatric disorders. Given that stress can trigger and exacerbate psychopathologies, a key question is whether we can identify behavioural probes to reveal vulnerability to stress. In my talk, I will provide examples from work in both animals and humans that reveals the power of behaviour -triggered by the exploration of novel environments- to predict subsequent stress reactivity in terms of both, cardiovascular biomarkers of disease and depressive-like behaviours. I will show how virtual reality in humans can be used to back-translate findings in rodents for the prediction of stress vulnerability. I will also present data on key neurometabolic underpinnings of psychopathological vulnerability to stress revealed by individuals' segregation based on a behavioural profiling approach.

Carmen Sandi is a Professor at the Swiss Federal Institute of Technology Lausanne (EPFL), where she leads the Laboratory of Behavioral Genetics. Her lab investigates the impact and mechanisms whereby stress and anxiety affect brain and behavior, with a focus on the contribution of brain mitochondria and metabolism. Her lab adopts an integrative research program in rodents and humans to study the neurobiological mechanisms involved in: i) motivated behavior; ii) enhanced risk to develop psychopathologies by early life stress. Experimental approaches in her lab include a combination of behavioral, neuroimaging, electrophysiological, neurochemical, pharmacological, metabolic, genetic and optogenetic methods in rodents, as well as translational work in humans using virtual reality, behavioral economics, experimental psychology (eye-tracking, computer-based tests) and neuroimaging (EEG, fMRI, MRI, 1H-MRS) approaches.

She has published over 220 research articles and received numerous awards and honours. She is the co-Director of the Swiss National Center of Competence in Research Synapsy and founder and co-President of the Swiss Stress Network. She was President of the European Brain and Behavior Society (EBBS) and is currently member of the executive councils of the European Molecular and Cellular Cognition Society (EMCCS) and EBBS. She is the Chair of the ALBA Network, and the immediate past-president of the Federation of European Neuroscience Societies (FENS).

Real problems and beast machines: predictive processing and conscious experience

Professor Anil Seth, Co-Director, Sackler Centre for Consciousness Science, University of Sussex

Consciousness is, for each of us, the presence of subjective experience. Without consciousness there is no world, no self: there is nothing at all. In this talk, I will illustrate how the framework of predictive processing (or active inference) can help bridge from mechanism to phenomenology in the science of consciousness. I will advance the view that predictive processing, precisely because it is not itself a theory of consciousness, is an excellent theoretical resource for consciousness science. I will illustrate this view first by showing how conscious experiences of the world around us can be understood in terms of perceptual predictions, drawing on examples from psychophysics and virtual reality. Then, turning the lens inwards, we will see how the experience of *being an embodied self* rests on control-oriented predictive (allostatic) regulation of the interior of the body. This approach implies a deep connection between mind and life, and provides a new way to understand the subjective nature of consciousness as emerging from systems that care intrinsically about their own existence. Contrary to the old doctrine of Descartes, we are conscious *because* we are beast machines.

Anil Seth is Professor of Cognitive and Computational Neuroscience at the University of Sussex, Co-Director of the Sackler Centre for Consciousness Science, and Co-Director of the Canadian

Institute for Advanced Research (CIFAR) Program on Brain, Mind and Consciousness. He is also Editor-in-Chief of *Neuroscience of Consciousness* and a Wellcome Trust Engagement Fellow. He holds degrees in Natural Sciences (MA, Cambridge, 1996), Knowledge-Based Systems (MSc, Sussex, 1996), and Computer Science and Artificial Intelligence (Ph.D., Sussex, 2001). He has published more than 180 papers and is listed in the Web of Science 'Highly Cited Researcher' index (2019 and 2020), and his 2017 TED talk has been viewed more than eleven million times. His new book - *Being You: A New Science of Consciousness* - will be published by Faber & Faber / Penguin in September 2021. Find out more: www.anilseth.com, @anilkseth

Inner workings of channelrhodopsins and brains: a new way of looking at the mind in action

Professor Karl Deisseroth, Department of Bioengineering, Stanford University, USA

Professor Karl Deisseroth is the D.H. Chen Professor of Bioengineering and of Psychiatry and Behavioral Sciences at Stanford University, and Investigator of the Howard Hughes Medical Institute. He received his undergraduate degree from Harvard, his PhD from Stanford, and his MD from Stanford. He also completed postdoctoral training, medical internship, and adult psychiatry residency at Stanford, and he is board-certified by the American Board of Psychiatry and Neurology. He continues as a practicing psychiatrist at Stanford with specialization in affective disorders and autism-spectrum disease, employing medications along with neural stimulation. Over the last sixteen years, his laboratory created and developed optogenetics, hydrogel-tissue chemistry (beginning with CLARITY), and a broad range of enabling methods. He also has employed his technologies to discover the neural cell types and connections that cause adaptive and maladaptive behaviors, and has disseminated the technologies to thousands of laboratories around the world.

Among other honors, Deisseroth was the sole recipient for optogenetics of the 2010 Koetser Prize, the 2010 Nakasone Prize, the 2011 Alden Spencer Prize, the 2013 Richard Lounsbery Prize, the 2014 Dickson Prize in Science, the 2015 Keio Prize, the 2015 Lurie Prize, the 2015 Albany Prize, the 2015 Dickson Prize in Medicine, the 2017 Redelsheimer Prize, the 2017 Fresenius Prize, the 2017 NOMIS Distinguished Scientist Award, the 2018 Eisenberg Prize, the 2018 Kyoto Prize, and the 2020 Heineken Prize in Medicine from the Royal Netherlands Academy of Arts and Sciences. For his discoveries, Deisseroth has also received the Perl Prize (2012), the BRAIN prize (2013), the Pasarow Prize (2013), the Breakthrough Prize (2015) the BBVA Award (2016), the Massry Prize (2016) and the Harvey Prize from the Technion/Israel (2017). He was selected a Howard Hughes Medical Institute Investigator in 2013, and was elected to the US National Academy of Medicine in 2010, to the US National Academy of Sciences in 2012, and to the US National Academy of Engineering in 2019.

