Psychiatry Grand Rounds

WCM Department of Psychiatry

Psychology CE Announcement

Precision Psychiatry

Prof Karl J. Friston, MBBS, MA, MRCPsych, MAE,
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Queen Sq, Institute of Neurology, UCL, UK

Wednesday, January 10th, 2024
11:00am – 12:30pm
https://weillcornell.zoom.us/j/92812036154
Meeting ID: 928 1203 6154
Password: 12345

1.5 CE credit available to WCM Department of Psychiatry full time and voluntary faculty Psychologists and Social Workers who sign in with their full name, attend the majority of the lecture and complete a survey which will be emailed following the completion of the lecture. Note the survey must be completed within 30 days of the lecture. Please contact wcmpsychiatryce@med.cornell.edu for additional CE information

SPEAKER:
Dr. Friston has no relevant financial relationship(s) with ineligible companies to disclose and DO NOT INTEND to discuss off-label or investigational use of products or services.

Karl Friston is a theoretical neuroscientist and authority on brain imaging. He invented statistical parametric mapping (SPM), voxel-based morphometry (VBM) and dynamic causal modelling (DCM). These contributions were motivated by schizophrenia research and theoretical studies of value-learning – formulated as the dysconnection hypothesis of schizophrenia. Mathematical contributions include variational Laplacian procedures and generalized filtering for hierarchical Bayesian model inversion. Friston currently works on models of functional integration in the human brain and the principles that underlie neuronal interactions. His main contribution to theoretical neurobiology is a free-energy principle for action and perception (active inference).

Abstract:
This talk considers formal or computational approaches to psychopathology. I will use psychosis as a case study in computational This talk considers formal or computational approaches to psychopathology. I will use psychosis as a case study in computational psychiatry. We first review the basic phenomenology and pathophysiological theories of schizophrenia, with a special focus on synaptopathy and neuromodulation. These motivate the choice of a formal or computational framework within which to understand psychopathology; particularly, in terms of false beliefs or inference. This framework is the Bayesian brain. We will focus on the (neuromodulatory) encoding of uncertainty or precision within predictive coding implementations of active inference – to demonstrate computational approaches to pathogenesis in neuropsychiatric disorders. The endpoint of this analysis is the key role of neuromodulation in selecting those aspects of the sensorium that underwrite our belief updating – and making sense of our lived world.

Learning Objectives:

1. Describe early taxonomies of dysconnection in terms of synaptopathy.
2. Analyze hallucinations and delusions in terms of predictive processing and active inference.
3. Discuss key role of neuromodulatory synaptopathy in underwriting hallucinations and delusions.

References:

1. Adams, R. A., Stephan, K. E., Brown, H., Frith, C. D., & Friston, K. J. (2013). The Computational Anatomy of Psychosis. *Frontiers in Psychiatry*, *4*. https://doi.org/10.3389/fpsyt.2013.00047
2. Friston, K. J. (2022). Computational psychiatry: from synapses to sentience. *Molecular Psychiatry*, *28*(1), 256–268. https://doi.org/10.1038/s41380-022-01743-z
3. Friston, K. J. (2017). Precision Psychiatry. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, *2*(8), 640–643. https://doi.org/10.1016/j.bpsc.2017.08.007
4. Powers, A. R., Mathys, C., & Corlett, P. R. (2017). Pavlovian conditioning–induced hallucinations result from overweighting of perceptual priors. *Science*, *357*(6351), 596–600. https://doi.org/10.1126/science.aan3458
5. Sterzer, P., Adams, R. A., Fletcher, P. C., Frith, C. D., Lawrie, S. M., Muckli, L., Petrović, P., Uhlhaas, P. J., Voss, M., & Corlett, P. R. (2018). The predictive coding account of psychosis. *Biological Psychiatry*, *84*(9), 634–643. https://doi.org/10.1016/j.biopsych.2018.05.015