

# Me and my Markov blanket

Karl John Friston

*UCL Queen Square Institute of Neurology, Wellcome Centre for Human Neuroimaging, 12  
Queen Square, London, United Kingdom*

How can we understand ourselves as sentient creatures? And what are the principles that underwrite sentient behaviour? This presentation uses the free energy principle to furnish an account in terms of active inference. First, we will try to understand sentience from the point of view of physics; in particular, the properties that self-organising systems—that distinguish themselves from their lived world—must possess. We then rehearse the same story from the point of view of a neurobiologist, trying to understand functional brain architectures. The narrative starts with a heuristic proof (and simulations of a primordial soup) suggesting that life—or biological self-organization—is an inevitable and emergent property of any dynamical system that possesses a Markov blanket. This conclusion is based on the following arguments: if a system can be differentiated from its external milieu, then its internal and external states must be conditionally independent. These independencies induce a Markov blanket that separates internal and external states. Crucially, this equips internal states with an information geometry, pertaining to probabilistic beliefs about something; namely external states. This free energy is the same quantity that is optimized in Bayesian inference and machine learning (where it is known as an evidence lower bound). In short, internal states will appear to infer—and act on—their world to preserve their integrity. This leads to a Bayesian mechanics, which can be neatly summarised as self-evidencing. In the second half of the talk, we will unpack these ideas using simulations of Bayesian belief updating in the brain and relate them to predictive processing and sentient behaviour.