Abstract. Effective goal oriented action requires that there is motion of the body through space. This poses fundamental challenges for motor control, as the spatial shape of the body changes in this process. To plan a movement, there must be knowledge of where in space the body is at any given time. In this talk I will explore how this mercurial and poorly understood body space might be structured. Evidence from patients with brain lesions, imaging, cognitive studies and neuronal recording will be used to show that the estimation of physical state in space is built from many different reference frames.

Scott Grafton, Professor in Psychological and Brain Sciences and Director of UCSB’s Brain Imaging Center, investigates the normal structure and function as well as pathology of the human sensorimotor system. He uses fMRI, magnetic stimulation and high density EEG to characterize the neural basis of goal directed behavior with an approach grounded in 20 years of experience as a clinical neurologist. He received his MD degree from the University of Southern California and completed residencies in Neurology at the University of Washington and Nuclear Medicine at UCLA. He has developed fundamental methods for mapping human brain activity and studied brain plasticity during learning in health and reorganization in the face of injury.