2008 Spring Colloquium Series

Speaker       Tom Albright, The Salk Institute for Biological Studies  
Time          4pm, Departmental Tea immediately following. 
Date          Friday, 15 February 2008 
Place         BCS Auditorium, 46-3002 
Title         In your mind's eye: Neural correlates of visual associative memory. 

Abstract:
Objects that are frequently seen together become associated in memory, such that the sight of one object readily brings to mind the image of the other. The acquisition of such memories is believed to result from the establishment or strengthening of connections between neurons that represent the associated stimuli. By this means, a neuron that represents a specific visual object, via "bottom-up" signaling from the sensory periphery, may also be activated by a second object that elicits recall of the first, via "top-down" signaling through newly established connections. Tests of this hypothesis have focused on the primate inferior temporal (IT) cortex because of its position at the pinnacle of the cortical visual processing stream, the selectivity of its neurons for complex objects, and its close connections with medial temporal lobe structures critical for learning and memory. The selectivity of many IT neurons does indeed change as predicted during associative learning. To explore the generality and mechanisms of this phenomenon, we recorded motion-sensitive neurons at an early stage of cortical processing. After animals learned to associate directions of motion with static shapes, these neurons exhibited unprecedented selectivity for the shapes. This emergent shape selectivity reflects activation of neurons representing the motion stimuli recalled by association, and it suggests that recall related activity may be a general feature of neurons in visual cortex.