What IF We Could Control the Brain for Better Health?

We will be welcoming to campus Walter Koroshetz, Director of the National Institute of Neurological Disorders and
Description: The NIH Brain Research through Advancing Innovative Neurotechnologies® (BRAIN)
Initiative is focused on the development of neurotechnologies that enable scientists to monitor and modulate brain circuits. It is a wonderful example of convergence science in which investigators from many disciplines joined the effort to build and test new tools that get us closer to understanding how our brain enables us to sense, think and act. The BRAIN Initiative aims to discover the fundamental principle of information flow and processing across our 85 billion neurons with trillions of connections and equal numbers of glial cells. The BRAIN Initiative is pursuing detailed analysis of both the hardware (the connections that form brain networks) and software (the activity that flows through the network to enable behavior). The promise of the BRAIN Initiative in understanding disorders of the nervous system cannot be overestimated. New tools for use in animal models such as optogenetic calcium and voltage indicators, Designer Receptors Exclusively Activated by Designer Drugs (DREADDS), extracranial electromagnetic or ultrasound energy driving channel opening in specific neurons, have initiated a new age in systems neuroscience by marrying powerful genomic and physiologic tools. The ultimate goal is to shed light on the circuits underlying human behavior or the circuit dysfunction that occurs in neuro/mental/substance abuse disorders. The complexity of the brain circuits draws many bright investigators from all areas of science, but a sustained effort from chemistry, material science, physics, computational science, mathematics and engineering will be needed to chip away at our ignorance about how the brain enables all our human capabilities. Clearly this is exciting work that will continue to evolve over decades and likely centuries.

**Date / Time:** Wednesday, October 2, 2019 - 7:00pm  
**Location:** Fowler Hall  
Stewart Center