



Cognitive Neuroscience



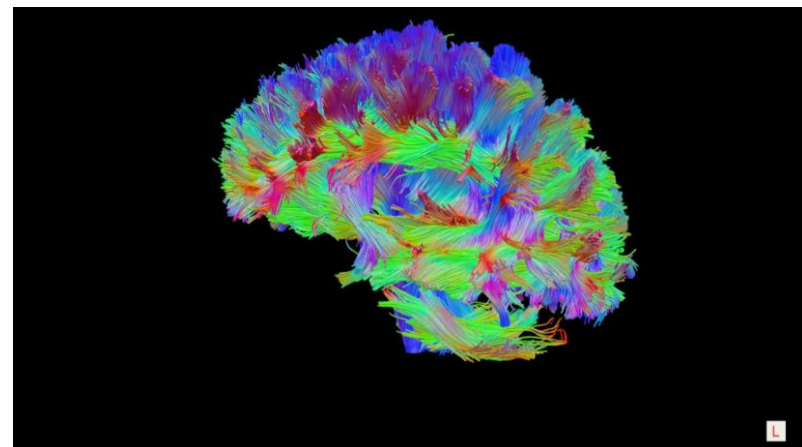
More deeply understand and more fully exploit the fundamental mechanisms of the brain.

- **Enabled capabilities**

- Deeper understanding of human information processing, learning and decision making
- New interfacing with engineered systems and displays
- Performance under stress
- Ameliorate/ prevent PTSD and TBI

- **Select breakthroughs**

- Advances in brain imaging; e.g. fMRI, Diffusion Tensor Imaging, and digital EEG.
- Advances in correlation of brain-structure to function
- Massively parallel computation enabling brain signal analysis



Map of brain interconnectivity as measured by Diffusion Tensor Imaging (DTI)

- **Key Research Challenges**

- Solving the inverse problem of predicting human behavior from brain signals
- Translating clinical measurements & analyses to uninjured personnel
- Developing models incorporating individual brain variability