

Computation in the Brain

How does the brain beget the mind? How do molecules, cells and synapses effect reasoning, intelligence, language, science? Despite dazzling progress in experimental neuroscience we do not seem to be making progress in the overarching question -- the gap is huge and a completely new approach seems to be required. As Richard Axel recently put it: "We don't have a logic for the transformation of neural activity into thought."

What kind of formal system would qualify as this "logic"? I will sketch a possible answer, informed by recent progress in understanding how the Brain creates language.

(Joint work with Santosh Vempala, Dan Mitropolsky, Mike Collins, and Wolfgang Maass.)