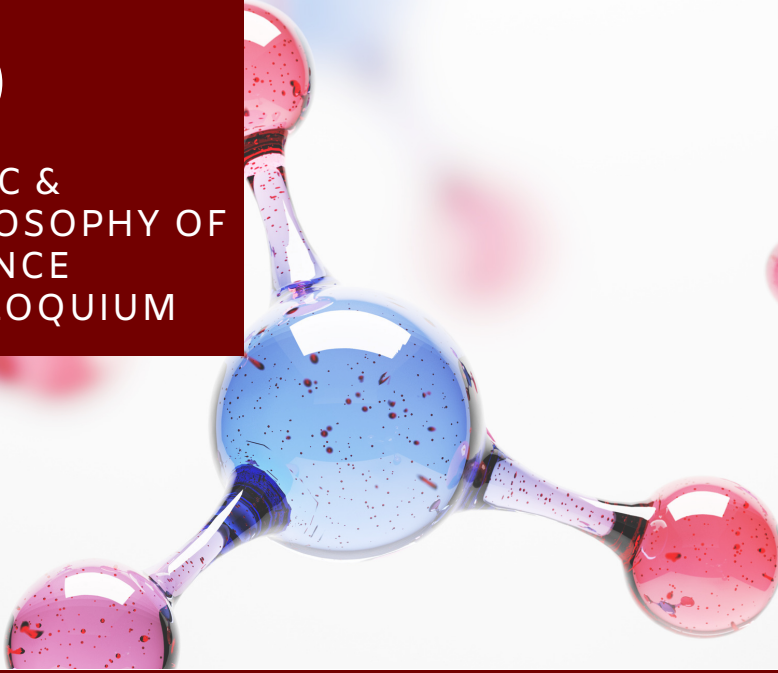




LOGIC &
PHILOSOPHY OF
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COLLOQUIUM



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"BIOLOGICAL MECHANISMS, ENERGY, AND WORK: MOLECULAR MOTORS AS EXEMPLARS"

Philosophical accounts of biological mechanisms have emphasized that they are organized systems of parts that each performing an operation. These accounts have largely ignored the fact that mechanisms perform work, which requires sources and constraints on flows of free energy. Scientists mechanistic accounts of cells fit the traditional mechanistic picture: they treat cells as chemical factories in which different chemical reactions are catalyzed in different loci in the cell and products move through the cell by diffusion. Research in recent decades on molecular motors has provided a different view in which material is actively transported throughout cells. Moreover, these motors have provided exemplars for investigations into how mechanisms direct flows of energy into the performance of work. Unlike with human-made motors which use heat or electricity as an intermediate energy form, the release of energy in ATP hydrolysis forces the movement of parts of molecules which is amplified in larger-scale movements. In this talk I describe research on three classes of molecular motors, myosins, kinesins, and dyneins, and what this research reveals about how energy is transformed into work in biological mechanisms. I also identify other implications of this research for philosophical thinking about biological mechanisms.

October 11th | 3-5 pm | SST 777