

Complexity / Emergent Behavior

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Complexity, a scientific theory which asserts that some systems display behavioral phenomena that are completely inexplicable by any conventional analysis of the systems' constituent parts. These phenomena, commonly referred to as **emergent behavior**, seem to *occur in many complex systems involving living organisms*, such as a stock market or the human brain.

For instance, complexity theorists see a stock market crash as an emergent response of a complex monetary system to the actions of myriad individual investors; human consciousness is seen as an emergent property of a complex network of neurons in the brain. Precisely how to model such emergence—that is, to devise mathematical laws that will allow emergent behavior to be explained and even predicted—is a major problem that has yet to be solved by complexity theorists.

The effort to establish a solid theoretical foundation has attracted mathematicians, physicists, biologists, economists, and others, making the study of complexity an exciting and evolving new scientific theory.



A termite "cathedral" mound produced by a termite colony is a classic example of emergence in nature.