

COMPLEX SYSTEMS

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Complex systems consist of groups of a variable (considerably high) number of components which interact with each other in a nearly unpredictable way.

This explains why they are so difficult to study.

As an interdisciplinary field of study it can explain many complex scientific phenomena. However, complex systems are much more present in our life than you may think.

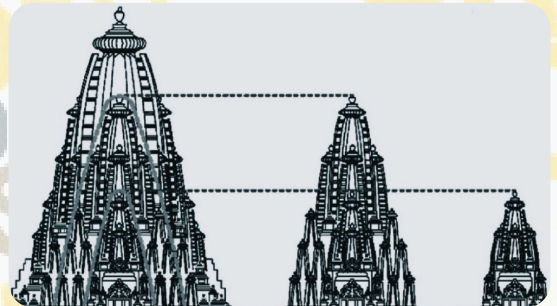
This "collective" approach coexists with the linear/reductionist one. Its origins might date back to the Greek philosopher Aristotle who wrote:

“The whole is more than the sum of its parts”

The butterfly effect shows how chaos theory and complex systems are connected.

They are both non-linear, the basis of their difficulty in academic and reality field.

This concept was used also in math with the development of fractal geometry in 20th century.

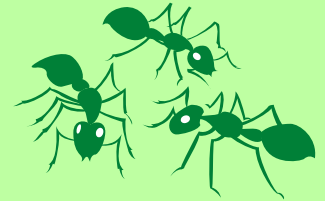


Biology



When we talk about complex systems we can talk about cells: there are infinite ways in which they can interact with each other and form life. For example in the human immune system six different types of cells operate together.

Also ecosystems are complex systems, in particular we can talk about ant colonies, in which several individuals unite and collaborate.



Our society itself has all the requirements in to be considered as a complex system:

- an high number of elements
- a self-organize tendency
- unpredictable and variable interactions

Each individual makes choices and acts and congregates with others to form institution.

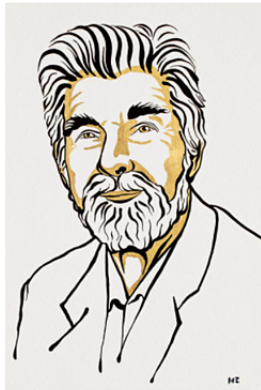


Social Phenomena

Nobel prizes



III. Niklas Elmehed © Nobel Prize Outreach
Syukuro Manabe
Prize share: 1/4



III. Niklas Elmehed © Nobel Prize Outreach
Klaus Hasselmann
Prize share: 1/4



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Giorgio Parisi
Prize share: 1/2

“For the discovery of the interplay of disorder and fluctuations in physical systems from atomic to planetary scales”

“For the physical modeling of Earth’s climate, quantifying variability and reliably predicting global warming “

